

# Municipal Journal

Volume XL.

NEW YORK, JANUARY 27, 1916

No.

## RESERVOIR IMPROVEMENTS AT CASTLETON

Preventing Pollution of Supply by Intercepting Stream above Swampy Area and Excluding Flood Waters from Reservoir—Securing Circulation in Reservoir—Itemized Cost of Work by Day Labor.

By HENRY W. TAYLOR.\*

The reservoirs of small municipalities are almost invariably constructed across the gorge of the stream which is the source of supply. Most of these reservoirs were originally built years ago and generally badly planned for both low water and high water stages of the stream. The reservoirs were generally installed with the least possible expenditure and with little reference to good design and the results of these conditions are generally as follows:

The area directly above the reservoir is (or becomes) swampy, and this condition is ignored. These swamps supply fit areas for algae development and organic growths and decomposition, and as these processes go on, their effect is noticed in the quality of the water. During low water stages of the stream, a natural drainage toward the reservoir takes place, and the accumulated deposits and growths depreciate the quality of the water supply.



PART OF SWAMP ABOVE RESERVOIR.

Shows character of swamp area through which water formerly passed on its way to the reservoir.

On the other hand, during high water stages, the layout is generally such that the flood-flows from the water shed seriously disturb the reservoir, roil the water, start bank erosion and raise the reservoir level unduly on account of the inadequacy of the waste weir provided. During these flood-flows, large quantities of organic matter, algae and vegetable growths are carried forward into the reservoir by the flushing of the flats above, and beside the roiliness of the water, there is the addition of tastes and odors from the foreign matter which is discharged into the reservoir.

Complete relief from the above conditions can often be effectively obtained at a small expenditure, properly directed.

The reservoir supplying the village of Castleton, N. Y., was a typical example of these conditions. The reservoir itself has a capacity of only about 12 million gallons,

while the water shed has an area of about six square miles, and is subject to a run-off during the flood-flows of from 450 to 600 cu. ft. per second. Just above the reservoir is a swamp about 500 ft. long and 300 ft. wide, through which the inlet to the reservoir runs along a circuitous route. Leading from the main channel of the brook are three low areas containing the usual green scum and vegetable and algal growths found in such stagnant waters.

During low water stage, there is always a tendency for the water which has backed up in the lobes of the swamp to drain forward into the reservoir, while during high water stage this accumulated material is quickly swept forward into the reservoir. As a result of the frequent bad color, taste and odor noticeable in the water, filtration was being seriously considered, when the writer was asked to make an examination of the conditions at the reservoir. It was at once apparent that certain work



DYKE BETWEEN RESERVOIR AND SWAMP.

North end of dyke. Entrance to by-pass at left. Inlet manholes at A and B.

must be done to improve the character of the water if filtration were not resorted to, or to protect the filters in case a filtration plant were installed.

About 500 feet above the reservoir, the channel of the brook was perfectly clean, the flow rapid and the water had all the usual characteristics of that of a clear spring brook. From this point, the brook wound circuitously through the swampy area to the reservoir, backing into the lobes of the swamp during high water, receiving drainage from the swamp during low water stages and flooding the swamps during high water stages. To overcome these conditions, a fifteen-inch tile pipe line was installed from the point in the brook mentioned above, to the inlet end of the reservoir. Near the end of the reservoir, this main line was branched so as to provide two separate inlets for the control of circulation through the reservoir. This new intake line intercepts the water in its natural state and carries it to the reservoir, avoiding the swampy areas and the consequent depreciation in quality.

\*Consulting Engineer, Albany, N. Y.

To overcome the effects of the high water stages of the creek, a dike was installed across the inlet end of the reservoir and a by-pass channel excavated through a hog back at the right of the reservoir. This by-pass channel was designed for a carrying capacity of 600 cu. ft. per second with a water depth of 3.5 feet, width 16 feet, slope 1 per cent. The storm flows of the creek will now run

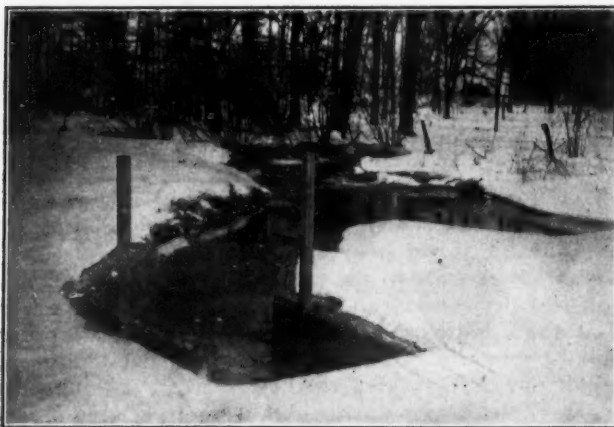


BY-PASS CHANNEL.

Shows excess of water not needed in reservoir and which would only disturb it if passed through it.

past the low intercepting dam at the head of the new fifteen-inch tile pipe, continue through the swamp and be discharged through the by-pass channel and returned to the normal creek channel below the reservoir. The by-pass channel was excavated to a sufficient depth to permit of the drainage of the major part of the swamp areas lying between the reservoir and the new point of water interception, so that during dry seasons of the year no nuisances will emanate from this swamp.

In the dike at the end of the reservoir are two manholes with outlets into the reservoir from the new fifteen-inch water supply line. In these manholes, shear gates are installed so that a part of or all the inflow to the reservoir can be prevented during high water stages, when even the brook water may be slightly roilly. In this case, the entire flow of the creek will be diverted around the reservoir and the village will be supplied from the reservoir storage until the creek water is again suitable for use. The new inlets proved very effective in producing a good circulation through all parts of the reservoir. The latter is unfortunately shaped and it has been



CONCRETE INTAKE AT HEAD OF SWAMP.

The water backs into the intake from the creek at right of picture. A low dam across the creek is flooded with excess water.

impossible heretofore to avoid stagnation, scum and vegetable growths in shallow bays.

By proper operation of these distributing inlets in conjunction with a deep blow-off pipe and the waste weir of the reservoir dam, all parts of the water surface can be flushed off and all parts of the lower strata of the reser-

voir can be kept supplied with fresh water, high in oxygen values.

The work was done under the direction of the local superintendent of water works and under the supervision of the engineer. The cost, exclusive of engineering, amounted to only \$1,372.13. The foregoing amount does not include the salary of the water works superintendent, who is a regular employee. The following table gives an approximate sub-division of the total charges.

Total material .....	\$426.60
Total labor .....	945.53

\$1,372.13

#### DISTRIBUTION OF CHARGES.

New intake line and accessories—		
Tile .....	\$159.21	
Labor and teaming .....	70.00	
Cement .....	5.00	\$234.21
Intake and manholes—		
Valves set .....	\$ 50.00	
Labor and teaming .....	46.00	
Cement, sand, gravel .....	31.00	
Forms .....	15.37	
		\$142.37
Bridge over by-pass channel—		
Sand, cement and gravel .....	\$ 15.00	
Labor .....	32.00	
Steel I beams .....	40.08	
Plank .....	18.47	
		105.55
Total cost for first 3 items of work .....		\$482.13
By-pass channel; excavation and placing of material—		
330 cu. yds. rock .....		
560 cu. yds. dirt.....		
890 cu. yds .....		890.00

**TOTAL COST OF WORK .....** \$1,372.13

The cost of excavation includes the cost of disposal of this rock and dirt in the reservoir dikes, in rip-rapping one side and one end of the reservoir and in filling in shallow lobes and irregular bays in same. The rock was hard, flinty ledge and was handled at very low cost. The village saved about \$600 on the original estimate and more than this amount on contract prices.

After flushing out the mains, a striking improvement in the quality of the water has been noticed by consumers even during the fall and winter months. In case filtration is required in the future to completely remove undesirable color, tastes, and odors in the water, the work already done is a preliminary step toward such a treatment plant and will serve to increase the feasible rates of filtration to reduce the cost of maintenance, and to maintain, even with filtration, a more constantly good quality of water for all weather conditions.

#### LOOSE-LEAF RECORDS IN PORTLAND.

A loose-leaf book system for keeping plats, codes, specifications and other documents which are changed in a few respects from time to time has been inaugurated by the City Commission of Portland, Oregon, and has been found successful from both the standpoint of convenience and economy.

Such documents as the building code, the electrical code, the plumbing code, field notes, bench level survey records, paving specifications and standard specifications for public works and important ordinances are printed on loose leaves and bound in such manner that they may be removed easily and new pages inserted when changes are made in the documents. This eliminates the necessity of reprinting the entire document from time to time after numerous changes have been made or the making of notations of changes on the border or on the back.

Documents printed for public distribution are bound in this manner and when changes are made the pages upon which the changes are made are reprinted and sent to those who have obtained copies of the document. The pages in the original document then are easily replaced with the revised sheets.

Of particular interest in the Portland system is the production of a complete set of plats of additions of the city in a loose leaf ledger 12 by 14 inches in size. Each page shows the lines in a quarter section of the city. The pages are produced from the original tracings by use of a Rectigraph. As changes in lines are made the original tracings are rephotographed and the page in the loose leaf device that has been changed is replaced.

The original tracings which were used up to a short time ago presented the plats 100 feet to the inch. The reduced loose leaf system presents the plats 250 feet to the inch. The new system is compact and easily handled.

## MACHINERY IN STREET CLEANING

**Cost and Efficiency of Cleaning with Squeegees, Flushing Machines and Rotary Brooms—Street Sprinkling—Decreasing Efficiency.**

The Bureau of Municipal Research of Milwaukee, Wis., last year made a study, the purpose of which was to discover what, if any, increase in efficiency and economy of conducting municipal work, especially that of street cleaning, could be effected by improvements in the equipment employed. "It requires more ingenuity," says the Bureau in its report, "on the part of the supervisor of street cleaning, to properly conduct his activities than on any other branch of municipal work. The entire success of the work depends not wholly upon the executive, however, but considerably upon the equipment used."

The street cleaning, as carried on at present, consists of flushing streets of the congested district nightly and patrolling them by white wings during the day. In the manufacturing and commission brokerage districts rotary brooms are operated by night, with white wings patrol and sprinkling service daily. Upon boulevards and smooth-surface pavements squeegees are operated from one to two times weekly, and upon streets with car tracks flushers are used once weekly. In residential districts sprinklers are operated twice daily, and there is a weekly cleaning with rotary brooms. In sections recently annexed hoe-cleaning is done when necessary.

In making the investigation each different class of cleaning was studied by itself and with the following results:

### SQUEEGEE CLEANING.

Ten squeegee machines are in constant operation upon smooth pavements. In certain sections of the city where the streets are exceptionally wide three are used in a staggered formation, requiring one and a half complete trips for a street to complete the cleaning. The work is routed in such a manner that little idle travel is necessary and the filling plugs to be used are so specified as to prevent traveling empty to any great extent. Where only two machines are operated four return trips are necessary to complete the work. Operators are not allowed to confine their work within one block unless conditions require this, but must continue on until the tanks are empty, which usually occurs at the end of the second block. Two laborers accompany these machines to keep the gutters free from dirt and from obstructing the water flowing to the catch basins. The work performed is very efficient and the cost of operation is economical.

The cost of the squeegee machines is \$1,250 each and the cost of operation is estimated to be as follows: Depreciation and repairs at 10 per cent on \$1,110 (which

is the cost of the machine without the roller), depreciation and repairs at 50 per cent on the \$140 (the cost of the roller only), and interest at  $4\frac{1}{2}$  per cent on the entire cost of the machine gives a total fixed charge per year of \$237.25. Painting is estimated at \$20, and hose and couplings at \$15 per season, giving a total season's cost of \$272.25. Allowing 150 days' operation per season gives a cost of \$1.815 per day. The operation cost consists of \$5 per day for team hire, \$2 for sweeper and 82c. for water (at 6c. per 1,000 gallons). This gives a total of \$7.82 per day for operation, and a total cost per machine per day of \$9.635.

The Bureau determined the amount cleaned by these machines in each of six sections. Later four of the sections were reorganized and the operation again studied. Under the old system, in which the political unit of wards was used in routing the squeegees, the average area cleaned daily was 262,295 sq. yds., at a cost of 33.2c per 1,000 sq. yds. After re-routing, disregarding the ward boundaries, the average cleaned daily was increased to 377,712 sq. yds., at a unit cost of 25.5c. per 1,000 sq. yds., a saving of about 23 per cent.

The squeegees are used in cleaning 1,105,324 sq. yds. which are free from car tracks. Some of these streets are squeegeed twice daily, others but once, and all have additional service of white wings and sprinklers.

The Bureau concluded from its observation that the streets were not sufficiently cleaned; that sprinkling is of no benefit; that dry sweeping is insanitary, and that by use of more equipment cleaning could be done daily in the congested districts three times weekly where semi-weekly is now performed, and twice weekly where the streets are cleaned occasionally.

A motor driven squeegee has recently been placed on the market which has a tank capacity of 750 gallons (the horse-drawn machine has 550-gallon capacity), which will permit larger areas to be cleaned without interruption for filling and thus reduce time lost at hydrants. This machine has two sets of sprays, one directly in front of the machine and the other in front of the squeegee. Back of the first sprays or sprinkler head is a set of two brushes to loosen any hardened matter that might not be reached by the squeegee roller.

When this machine is used, laborers to assist the flowing of water to the catch basins are unnecessary, as sufficient water is discharged to remove any slight obstacles that are not removed by horse-drawn equipment. The Bureau has made several tests of this machine and the manufacturer has accepted a suggestion that it be mounted on a standard chassis so that at the end of the cleaning season the tank can be replaced with a box to make it available for other purposes.

This machine costs \$4,000, and the cost of operation is calculated as follows: Depreciation and repairs at 25 per cent on machine only (\$3,850), and half of this chargeable to street cleaning (since the chassis will be used half the year for other purposes) gives \$481.25. One-half of interest at  $4\frac{1}{2}$  per cent on \$4,000 and \$85 for one roller per season brings the total fixed charges to \$656.25. The maintenance cost is estimated to consist of \$15 per season for hose and coupling; four tires at \$52.50, with depreciation at 50 per cent (one half chargeable to street cleaning), gives \$52.50, and with \$2 for replacing two brushes each season gives a total of \$69.50; or a total cost per season of \$727.75, or \$4.84 per day, assuming 150 days' operation. The operation cost per day would consist of one sweeper at \$2, one chauffeur at \$3, gasoline and oil, \$1.82, and water (at 6c. per 1,000 gallons) \$1.60, a total of \$8.42.

This gives a total cost of fixed charges, maintenance and operation of \$13.26. An average of 80,000 sq. yds.

were cleaned per day with the machine, giving an average cost of 16½c. This is 9c. per 1,000 sq. yds. cheaper than the result obtained with the horse-drawn machine. It will be noticed that the cost would be increased \$4.156 if the fixed and maintenance charges had not been reduced because of the assumption that the machine would be used half of the time for other work, and this would increase the cost per 1,000 sq. yds. to 21.8c., still a little less than the cost by a horse-drawn machine.

#### FLUSHER CLEANING.

Although some have claimed that flushing is detrimental to a pavement in that it removes the filler, this has not been found to be the case in Milwaukee. "The one fact that remains uncontradicted is that flushing machines clean the streets of every particle of debris and leave the thoroughfares in a sanitary condition, a matter of the most vital importance." The street cleaning department operates eight of these machines both day and night, the night work being confined to two districts, comprising the heavy traffic and commercial territories, and each alternate night the streets are flushed.

Four machines are used, operated in a staggered double formation, cleaning the entire area without a return movement. When intersecting streets are encountered the two rear machines perform the work and then return to the original formation. A great deal more territory is thus covered than if the machines were paired and each allotted a given area. The day work is performed in like manner, except that the remaining four machines are assigned to outlying districts exclusively.

The cost of this operation is analyzed by the bureau as follows: Cost of machine, \$1,500, of which the wagon and tank are figured at \$1,000 and the engine at \$500. Depreciation on the wagon and tank at 10 per cent and on the engine at 25 per cent, and interest at 4½ per cent on the \$1,500, give a total fixed charge of \$292.50. For maintenance is allowed \$20 for painting each season and \$15 for hose and couplings. The \$327.50 thus obtained as total charges, divided over 150 days' operation, gives an average cost of \$2.18 per day. The cost of operating is given at \$5 per day for team and driver, \$2 for laborer, 90c. for water, 55c. for gasoline, and 10c. for oil; total daily cost, \$8.55, or a total, including fixed charges and maintenance, of \$10.73.

In 1915 two machines in one part of the city cleaned 242,000 sq. yds. twice a week; in another district four machines cleaned 297,200 sq. yds. once a week; in still another, four machines cleaned 301,000 sq. yds. once a week; and in a sixth district four machines 119,500 sq. yds. twice a week, and 108,000 sq. yds. twice a week, respectively; and in a sixth district four machines cleaned 285,000 sq. yds. once a week. In night work in the business district four machines cleaned 292,800 sq. yds. three times a week. These give costs per 1,000 sq. yds. varying from 26.2c. to 35.3c.

The Bureau recommends flushing for the reasons already explained, and in doing so states that sprinkling of streets will be greatly reduced, the slippery surface of the thoroughfares caused by sprinkling will no longer exist, and a cleaner and more sanitary condition will result.

#### STREET SPRINKLING.

During the year 1914 the Bureau of Street Sanitation owned 123 sprinklers, which were operated under the jurisdiction of ward superintendents. As in the case of other operations, districting by wards was found to be uneconomical and the areas laid out were invariably inadequate. As just stated, the Bureau of Municipal Research is not in favor of sprinkling where the streets can be cleaned by flushing, but states that under the present condition sprinkling is necessary. The number of times a street is sprinkled daily depends wholly upon

weather conditions, the nature of the pavement and the location, but rarely exceeds four. The sprinkling operation is analyzed as follows: Cost of sprinkler, \$325. Depreciation at 5 per cent and interest at 4½ per cent give \$30.87; maintenance at \$35 for painting each season and \$15 for hose and couplings gives a total cost per season of \$80.87, or a cost per day of 54c. The operating cost consists of \$5 for team and driver and 80c. for water, giving a total cost per day of \$6.34. The average area sprinkled daily is 96,000 sq. yds., giving a cost of 6.6c. per 1,000 sq. yds.

#### ROTARY BROOM SERVICE.

Rotary brooms are generally used in the industrial and outlying residential sections and upon streets adjacent to wharves and where pavements are constructed of brick, sandstone, limestone or granite. Cleaning is done at night on account of the dust and a sprinkler is used in advance of the broom. Eight of these machines are used by the city. The machines cost about \$250 each, and depreciation at 10 per cent and interest at 4½ per cent gives fixed charges of \$36.25 per year. Maintenance is estimated to consist of \$20 for minor repairs and replacements; \$24 for 500 pounds of bamboo for each of six brooms at 8c. per pound, and \$12 for 48 hours of labor at 25c. per hour. This gives a total maintenance cost of \$56. The cost per season is thus estimated at \$92.25, or 61½c. per day. Operating requires two sweepers at \$2 per day, team and driver at \$5, and grease, etc., at 5c. This gives a total cost per day of \$9.665. The machines average 40,000 sq. yds. cleaned per day, giving a cost of 24.1c. per 1,000 sq. yds. The sprinkler cost \$5 per day and 90c. for water, or 14.7c. per 1,000 sq. yds. on a basis of 40,000 sq. yds. sprinkled per day. This gives a combined cost for sprinkling and sweeping of 38.8c.

Concerning pick-up sweepers the Bureau states that a perfect device of this nature would eliminate the unsanitary and expensive features of sprinkling and dry sweeping. A machine was investigated by it which cost \$4,000, travels at the rate of four miles per hour and sweeps a strip nine feet wide. It estimates that about 75 per cent of this theoretical performance could be obtained, which would give 126,720 sq. yds. per day per machine. "It is," says the Bureau, "the only machine which could be employed in cleaning macadam pavement without any serious results, as the present system of constant sprinkling to allay the dust is detrimental, as it causes rapid deterioration." Estimating a depreciation of 50 per cent and interest at 4½ per cent on this machine gives fixed charges of \$2,180 per year. Maintenance is estimated to cost \$25 for minor repairs, \$180 for replacing brooms 30 times at \$6 each and \$60 for labor on brooms, giving a total yearly cost of \$2,445, or \$16.30 per day. Operating is estimated to cost \$3 per day for chauffeur, \$4 for two sweepers, \$2.50 for half day of team removing sweepings, \$1.25 for gasoline and oil, and 12c. for water; a total daily cost of \$27.17, or 21.4c. per 1,000 sq. yds.

#### SANDING ICY SIDEWALKS.

By CHESTER W. SHAFER.

Lewis D. Cutcheon, general manager of the board of works at Grand Rapids, Mich., has successfully solved the problem of making sidewalks in the hill district safe for pedestrians in the winter. With the assistance of several mechanics he constructed a sander, the efficiency of which has been clearly demonstrated.

A bin, constructed of heavy planking, six feet long, two feet in depth and two feet in width at the top, gradually tapering, was built and attached to a heavy axle connecting two heavy, iron wheels. A steel sieve, with holes ranging from a quarter of an inch to a half inch in diameter, four inches apart, constitutes the bottom

of the bin. A lever, connected to a thin steel plate over the sieve, regulates the flow of sand with which the bin is filled.

During the winter the numerous long hills in Grand Rapids, despite the fact that gangs of men work incessantly to keep them clean, become covered with ice and under ordinary conditions are not negotiable. Residents failed to distribute ashes freely and numerous accidents led Mr. Cutcheon to his idea. At 2 a. m., on mornings following a storm, the driver of the sander fills up the bin and starts his work. He uses nearly a cubic yard of sand at each loading and is able to cover more than a half-mile before reloading is necessary. Loading stations are maintained at the terminus of the various routes which have been mapped out to a nicety by engineers.

The sand which is used is moistened before it is placed in the bin. Dry sand was used at the start but high winds quickly carried it away. The sander leaves behind a distinct trail, the width of the walk, and after a few pedestrians have traversed the hill all danger of accident is obviated.

The idea of the sander was original with Mr. Cutcheon and he believes it is the only machine of its kind used in the country. He declares that every city which is troubled with a hill district in the winter, should pattern a

machine after his and maintain it. The expense of operation is very low, the services of a driver and horse being the only reckoning, and the saving to the city and to the residents is more than commensurate.



SAND SPREADER, GRAND RAPIDS.  
Used for sanding sidewalks.

## PRACTICAL STREET CONSTRUCTION

### DIAGONAL THOROFARES.

**Oblique Junctions and Traffic—Single and Double Junctions—Pedestrian Traffic at Such Points—Multiple Traffic Centers—Duplicating Thorofares.**

Congestion of traffic may be occasioned not only at focusing points or centers of concentration, but also at junctions and crossings—in fact, wherever lines of heavy traffic meet or cross each other.

Fig. 1 shows a junction of two diagonals with a third street at a common point, the lines and arrows showing routes of traffic, both vehicular and pedestrian. (There may be two or more lines of vehicles traveling one route and represented by one line.) This shows 16 crossings of vehicle traffic routes. If we separate the junctions of the diagonals with the vertical street, however (see Fig. 2), we have only three crossings at each junction, or six altogether; less than half the traffic crossings found in the first case, and less than one-fifth of this number at any one corner.

The second plan increases the distance to be traveled in passing from one diagonal to another, and Fig. 3 shows how this can be remedied. Such cross-overs are indeed even more desirable where the two junctions come together as in Fig. 1, for they would remove from this junction point most of the traffic passing from one diagonal to the other, or eight of the sixteen traffic intersections. From the single junctions they would remove two intersections from each, leaving only one at each of the two staggered intersections, as compared with eight at the combined intersection.

At an oblique crossing (Fig. 4) there are eight traffic route crossings, and three at each of two oblique junctions of parallel streets with a third (Fig. 5). With a square intersection there are sixteen route crossings, as there would be in Fig. 4 also if traffic in turning the acute corners, as from D to C, were required to pass up to and around the center E.

The above illustrates the desirability, from the point of view of traffic safety, of avoiding such construction as Fig. 1, using rather that shown in Fig. 3. Also that a

staggered crossing, Fig. 5, has advantages over a continuous oblique crossing, Fig. 4; although if both the streets making the oblique crossing are thorofares, a break in the line of either of them is, in spite of this advantage, not generally desirable.

Figures 1 and 2 show the pedestrian traffic at oblique corners crossing the diagonal streets at right angles. As a matter of fact, that following the continuous street would probably keep on the sidewalk line rather than make a detour that would add 40 per cent to the distance if the oblique angle is 45 degrees, and 22 per cent if it is 15 degrees—only five or ten steps, in most cases, but it seems more. This length of roadway crossing and the curved paths of all vehicles turning from or into an oblique street make such crossings especially difficult and dangerous for pedestrians. Fig. 8 shows a "rush hour" crowd making an oblique crossing in New York, vehicles and pedestrians being mingled in the roadway. This is an objection to oblique angles at centers of pedestrian traffic.

From the above it appears that, while diagonals leading to a traffic center are advantageous, it is better that they should join the main rectangular thorofares (or each other, if there is not a general rectangular system) at points separated by intervals of at least two or three hundred feet and removed a block or more from the very heart of the business center.

#### TWO OR MORE CENTERS.

There is generally more than one traffic center in a city, one at the retail business center and others at a freight station, bridge, manufacturing center, etc. Consequently two or more sets of radials may be required, which will more or less overlap. The treatment of all will be much the same as to alignment, although more consideration should be paid to obtaining flat grades in the case of thorofares leading to center of freight traffic or districts where heavy articles are manufactured than of those leading to retail business centers. Such a double system is shown in Fig. 6, which, while imaginary, can be found reproduced more or less closely in several cities. A bridge crosses the river at a; at c is the business center marked

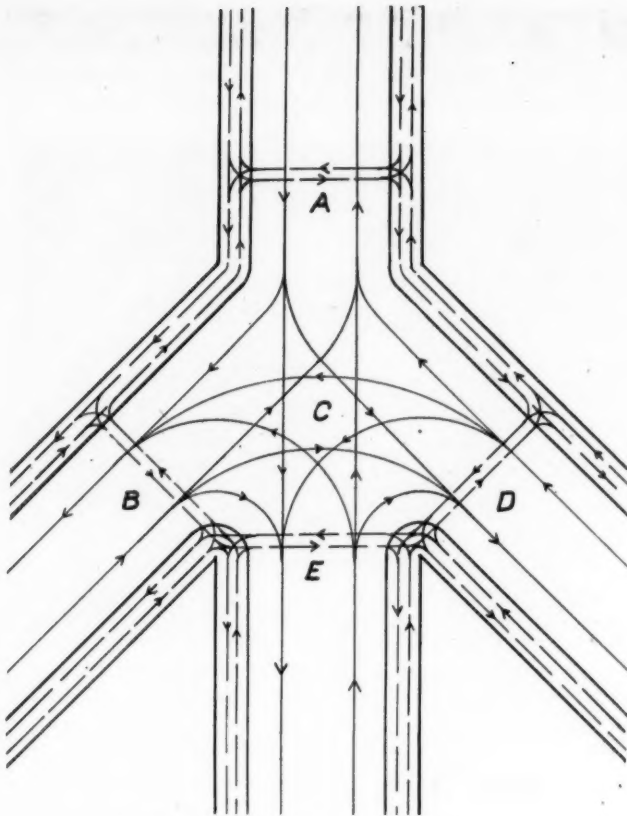


FIG. 1. OPPOSITE JUNCTIONS.

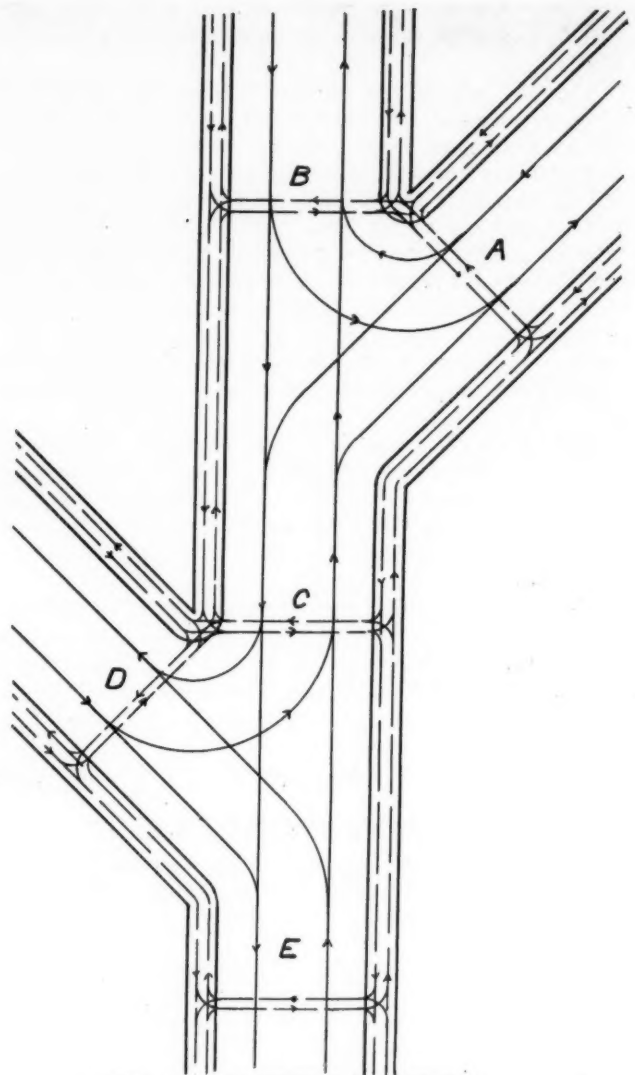
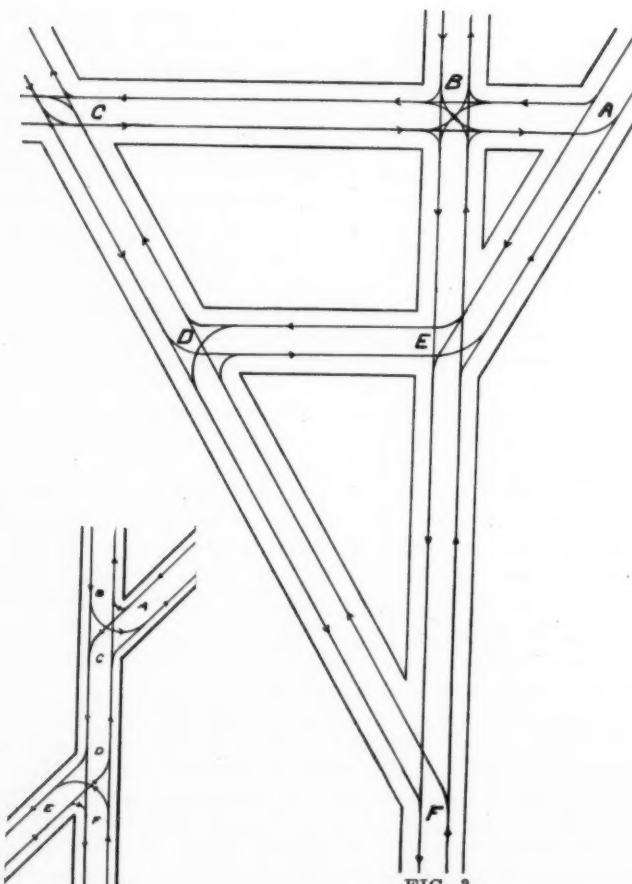
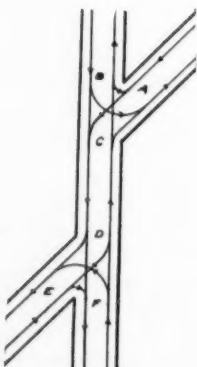


FIG. 2. STAGGERED JUNCTIONS.

FIG. 3.  
CROSS-OVERS  
BETWEEN  
DIAGONALS.FIG. 5.  
STAGGERED  
CROSSING.

Bringing two diagonals into a third street opposite each other, as in Fig. 1, is not generally so desirable as to stagger the junctions, as in Fig. 2, chiefly because the confusion of traffic is greater in the former. In Fig. 1 there are sixteen crossings of traffic routes (there may be two or more lines of traffic to each route), and eight points of junction of routes and eight of divergence. While in Fig. 2 there are six points of intersection, six of junction and six of divergence; and in the latter, only half the total number occur at one junction. The ultimate congestion is not diminished, but that at street intersections is.

The congestion at intersections can be reduced by introducing cross-overs (Fig. 3), thus drawing off traffic passing between AE, BE and CD.

Where a diagonal street crosses rather than joins (Fig. 4), the crossing may be staggered (Fig. 5) and traffic confusion at one point somewhat diminished; but this adds to the traffic in the stretch CD,

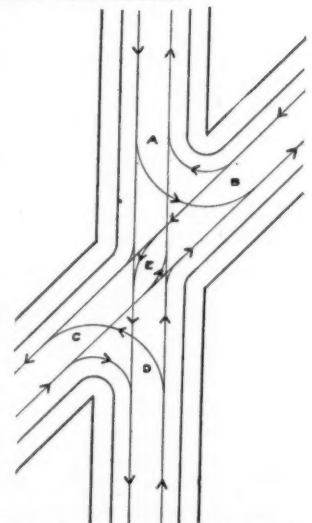
FIG. 4. TRAFFIC AT AN  
OBLIQUE CROSSING.

Fig. 5, is less convenient for traffic along the diagonal, and is not generally advisable.

by an open square. At *k* is a manufacturing center, receiving freight by river at the foot of the street opposite *k*, and by the railroad *al* at the freight station *l*. From *c* we have as radiating thoroughfares *a c*, *cd*, *e j*, *c i*, and *b h*; while *a g h* and *n b* divert the bridge traffic

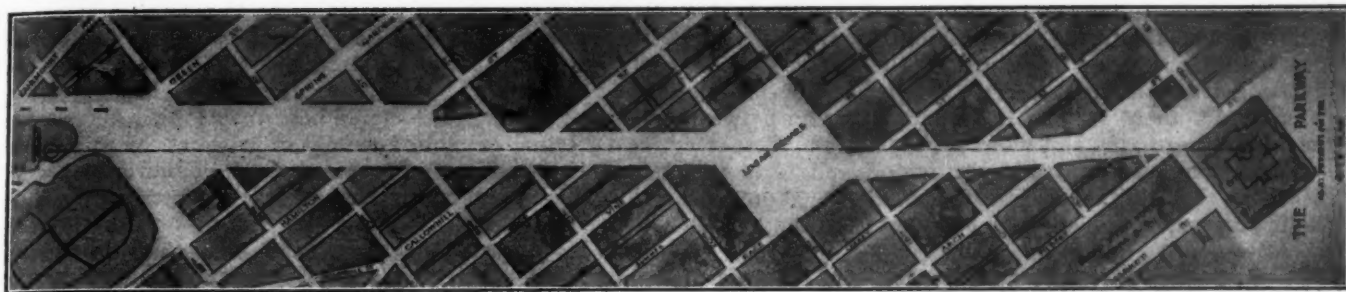
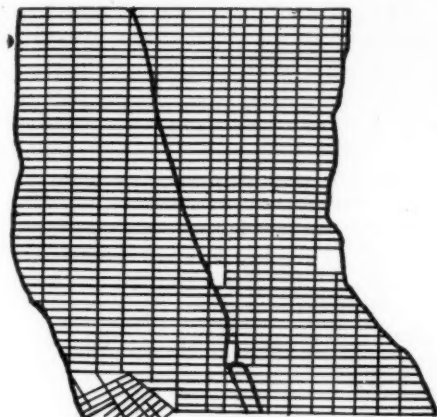
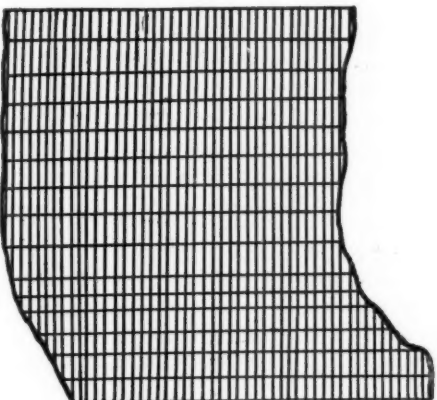


FIG. 10. PLAN OF PROPOSED PARKWAY FORMING A DIAGONAL FROM CITY HALL TO FAIRMOUNT PARK, PHILADELPHIA.



Part of New York As It Is.



Direction of Blocks Changed 90°. FIG. 7. NEW YORK FROM 9TH TO 59TH STREETS.

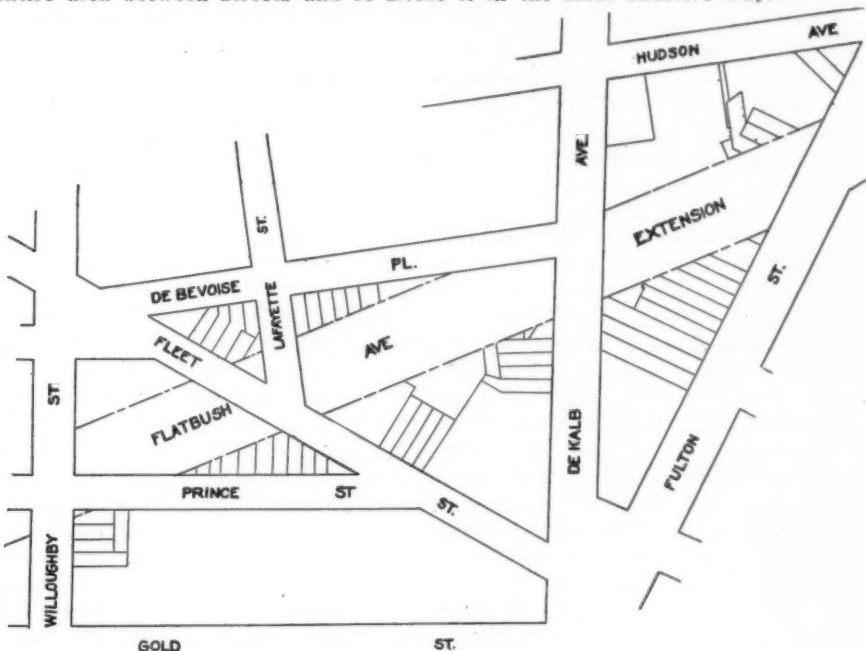


FIG. 9. CONFUSION OF PROPERTY LINES CAUSED BY NEW STREET.

The illustrations above, Fig. 7, show part of New York City as it is, and how many more north and south avenues would be available if the same blocks were changed 90° in direction.

In Fig. 6 is an imaginary section of city, showing two traffic centers, one residence and the other manufacturing. Main thoroughfares are shown in heavy lines. The light lines show different ways of arranging minor streets on the rectangular plan, to be considered later. Concentration of lines toward the center C and dispersion of them as they approach that center are provided for as shown.

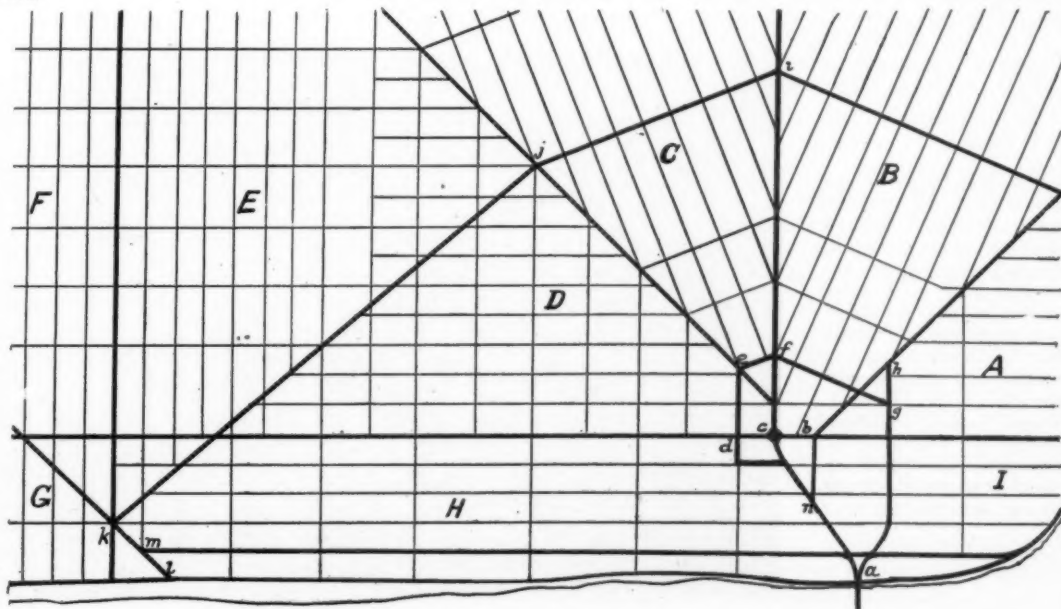


FIG. 6. TWO TRAFFIC CENTERS, AFFECTED AREAS OVERLAPPING.

from the center to the right, and **a m** connects the bridge with the manufacturing center and the freight yards near **l. d e f g** is a ring street around the business center, diverting from this to the right and left traffic passing from **B** or **C** to **A, I, D** or **H**. Communication between the radial thorofares and from sections **B** and **C** to the manufacturing center **k** and sections **F** and **G** is furnished by the cross thorofare **i j k**; while the thorofares leading up and to the left from **k** connect this center with the residence sections **E** and **F**.

In some cities there are no diagonals and the cost of cutting them through built-up property seems prohibitive. But the discussion given herewith shows how desirable they are, and they should be provided in all plans where this is possible; the greatest pains being taken in locating them to foresee future traffic conditions and requirements so far as this is possible, and to provide for them with the least present inconvenience and expense. The failure to do so may later prove to be a serious handicap to the city. Several cities have spent hundreds of thousands in remedying such omissions, and scores of others would provide one or more diagonals urgently needed by traffic if the cost were not so enormous of purchasing and destroying expensive buildings standing on the proposed route. (See Figs. 9 and 10.)

As stated, a straight thorofare is generally desirable; but a more or less winding diagonal, laid out so as to avoid very expensive buildings, is much to be preferred to none at all. In a number of cities it is possible to even improve conditions as to structures by so running a diagonal as to wipe out "eye sores," "fire traps," and other relics of an outgrown business infancy which are worse than valueless as a municipal asset. Even if the need of diagonals is not yet felt, experience shows that it will be in the future if the city grows, and no city will admit that it does not expect to grow, or a village that it will not some day be the center of a city.

Whether there are only the two intersecting thorofares which determine the business center, or are also one or more diagonals, the traffic may become so great on any one or more of them as to be undesirably congested. This can, as said before, be met by widening the street or providing more thorofares; the latter being preferable. The additional thorofares will generally be those streets parallel and immediately next to the original main thorofares. Consequently these streets should from the first be laid out with the idea of being so used later on. (An illustration of this duplication of thorofares in Atlanta, Ga., was described in an article in the January 13th

issue.) They should preferably be as near as practicable to the main thorofare; and in fact, as stated in the District of Columbia rules, streets parallel to radii from the center should be closer together than those crossing them; that is, blocks should have their longer dimensions along radial or approximately radial lines, or in general parallel to the lines of greatest traffic. Failure to observe this rule in planning New York (Manhattan Island) above 8th street is costing the city millions of dollars. The blocks are longer east and west than north and south, although much the greatest traffic moves in the latter direction. As a result, the fourteen streets provided for north and south traffic are crowded, especially the one diagonal, Broadway. If the blocks had been turned the other way but given the same dimensions (see Fig 7) there would have been thirty-nine streets to carry this traffic, thus greatly relieving it without increasing the total street area at all. Moreover the frontage on these streets, which is more valuable than that on the cross streets, would be increased nearly three-fold, thus keeping down inflated values for such frontage. How frequent the cross streets should be will be considered under the subject of sizes of blocks; but the streets leading in the direction of the greatest volume of traffic should generally be as close together as will permit of economical and desirable depths of abutting lots.

#### TRACTION ENGINE COST.

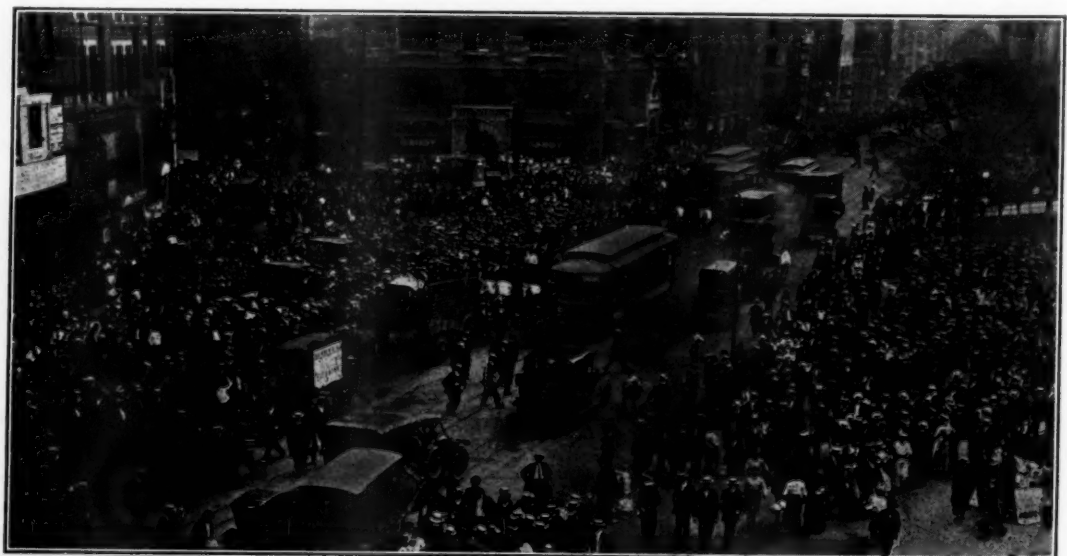
The Street Department of Columbia, S. C., has been using a Case gasoline traction engine for hauling a scarifier and road machine, as described in Municipal Journal for February 11, 1915. During the year 1915 it was operated 185 days at a total cost of \$1,768.03, or \$9.56 per day; 504 blocks being worked at a total cost of \$3.51 per block. This cost does not include extraordinary repairs and a complete overhauling which the tractor received during the year, but includes 3,545 gallons of gasoline, engineer's services, oil, waste, etc.

During 1915 the department purchased a Frick steam traction engine of 60 brake horsepower, which was operated 155 days at a total cost of \$1,025.19, or \$6.61 per day; 367 blocks being worked by it at a cost of \$2.79 per block. The engine used 62½ tons of coal.

A 10-ton Kelly-Springfield steam road roller was operated 149 days, using 41 tons of coal, at a total cost of \$810.36, or \$5.44 per day; 229 blocks being rolled at a total cost of \$3.54 per block.

The above information is from the annual report for 1915 of John McNeal, city engineer of Columbia.

The rush-hour crowd coming up Park Row, New York, toward Brooklyn bridge, crosses the diagonal intersection of Nassau street in the roadway—a distance of about 300 ft., while vehicles work their way slowly through the crowd. These long roadway crossings are one of the chief objections to these sharply acute street intersections.



Courtesy, C. N. Green, Engineer, New York Public Service Commission.

FIG. 8. PEDESTRIANS CROSSING ROADWAY AT ACUTE ANGLE JUNCTION.

# Municipal Journal

Published Weekly at  
50 Union Square (Fourth Ave. and 17th St.), New York  
By Municipal Journal and Engineer, Inc.  
Telephone, 2805 Stuyvesant, New York  
Western Office, Monadnock Block, Chicago

S. W. HUME, President  
J. T. MORRIS, Treas. and Mgr. A. PRESCOTT POLWELL, Secretary  
A. PRESCOTT POLWELL, Editor

Subscription Rates  
United States and possessions, Mexico, Cuba.....\$3.00 per year  
All other countries..... 4.00 per year  
Entered as second-class matter, January 3, 1906, at the Post Office at New York, N. Y., under the Act of Congress of March 3, 1879.

## CHANGE OF ADDRESS

Subscribers are requested to notify us of changes of address, giving both old and new addresses.

Contributions suitable for this paper either in the form of special articles or of letters discussing municipal matters, are invited and paid for.

Subscribers desiring information concerning municipal matters are requested to call upon MUNICIPAL JOURNAL, which has unusual facilities for furnishing the same, and will do so gladly and without cost.

JANUARY 27, 1916

## CONTENTS

Reservoir Improvements at Castleton. (Illustrated.)	
By Henry W. Taylor .....	101
Loose Leaf Records in Portland .....	102
Machinery in Street Cleaning .....	103
Sanding Icy Sidewalks. (Illustrated.) By Chester W. Shafer .....	104
Diagonal Thorofares. (Illustrated.) .....	105
Traction Engine Cost .....	108
Bureau of Complaints .....	109
John A. Hill .....	109
Economy of Flushing Sewers .....	109
The Week's News .....	110
Legal News—Notes of Recent Decisions .....	116
News of the Societies .....	117
Personals .....	118
New Appliances (Illustrated.) .....	119
Industrial News .....	121
Contract News .....	122

## BUREAU OF COMPLAINTS.

The average citizen of a large city who wishes information as to when garbage is supposed to be collected from his house, why his street is not sprinkled, when the assessment roll is made out, what are the duties of the shade tree commissioner; or who wishes to complain that his neighbor does not remove the snow from his sidewalk, that the street lamp near his house has not been lighted for several nights, that a nuisance exists on a property objectionably near his home, or that there is a dangerous hole in the street—such citizen often does not know what official or department to get in touch with and in the uncertainty may confine himself to talking of the matter among his neighbors and arousing discontent, instead of bringing it to the attention of the city officials where it would receive attention.

Many a man who remains a persistent critic of an administration because of some slight grievance of this kind would have been friendly to it had he "got it off his mind" by reporting the matter to headquarters and been politely thanked for bringing it to the attention of the officials and been assured that it would be attended to or else had the reason explained to him.

Several cities have established what might be called municipal information and complaint bureaus, where cit-

izens can obtain any information concerning the city's affairs or lodge complaints; others have designated some official or office to act in this capacity—the city clerk or police department are often given this duty. The mayor, under most forms of government, is the one individual who receives the greater part of the credit or blame for the conduct of the city's affairs, and is therefore especially interested in keeping the citizens friendly, and he or his office might well serve in this capacity.

Whatever the official, he should be invariably polite, patient with either ignorance or anger, politic, and should have complete knowledge of the functions of all the city administrative offices. And communication with him should be simplified as much as possible, some method or methods being employed to bring the matter to the notice of all citizens. The telephone company might be asked to paste on the cover of all telephone directories a notice—"For information or complaints concerning city matters, call 1,000;" or the city might distribute small leaflets on cardboard, handy to keep and refer to, giving this, in addition to the telephone numbers of fire and police headquarters, the location of fire boxes, and possibly one or two other matters; but not too many, for it should be possible to obtain each of these items of information instantly without having to search for it among a mass of other items.

## ECONOMY OF FLUSHING SEWERS.

In his annual report for the year 1915, F. J. Leaming, city engineer of Sedalia, Mo., says: "We have had very little trouble with stopped sewers during the past year, which clearly demonstrates that it is good policy to flush the dead ends of all sanitary sewers at least twice a year, as our entire system of sewers can be flushed for less than the cost of digging up and opening one bad stoppage."

To say nothing of the objectionable features connected with sewer stoppages, the chief of which is the gases and odors given off by putrefying matter retained by them, we have here a good dollars-and-cents reason for keeping sewers clean, and for frequent periodic inspections to insure that deposits are discovered promptly.

## JOHN A. HILL.

By the death on January 24th of John A. Hill, there passes away the founder and president of one of the largest firms in the world publishing technical periodicals. The Hill Publishing Company was the owner of Engineering News, Engineering and Mining Journal, Power, Coal Age, and American Machinist. The McGraw-Hill Book Company, in which Mr. Hill was an officer and large stockholder, has published a number of technical books, among them Metcalf and Eddy's "American Sewerage Practice," Fuller's "Sewage Disposal" and others dealing with subjects of importance to municipalities.

Mr. Hill was a picturesque character, a self-made man of great force. After serving as a printer, machinist and locomotive engineer, he purchased in 1888, when thirty years old, a periodical known as "Locomotive Engineering," and from that time has continued as a publisher of technical papers, four of which he purchased (Engineering News was the latest in 1911), and one of which—Coal Age—he established.

Mr. Hill was vice-president of the Machinery Club and member of the Engineers' Club of New York City, and of the Railroad Club, Campfire Club and American Society of Mechanical Engineers. His strong personality made itself felt in organizations of class paper publishers and in all others in which he took personal interest, and he continued to the end the controlling power in the Hill Publishing Company.

## The WEEK'S NEWS

State Highways in Rhode Island, Arkansas, Pennsylvania and Illinois—Typhoid Record of Providence—Springfield, Mass., Water Works—Broken Main Troubles in Harrisburg and Seattle—New York's Franchise Suits—Kansas Gas Battles—Fire Record of Exposition—New Motor Apparatus—New York Optional Charter Law Unconstitutional—The Troubles of City Managers—Garbage Collection in Peoria and Syracuse.

### ROADS AND PAVEMENTS

#### Highway System of Rhode Island.

Providence, R. I.—The fourteenth annual report of the state board of public roads of Rhode Island has been made public. The chief topic is a complaint that no appropriation was made by the general assembly during the past year. The report says in part: "The plain fact is that our highway system now is not what the people demand and it is going to take a great deal of money in addition to the automobile fund to get the roads already built into condition. With waterbound macadam in various stages of disintegration, constituting about 73 per cent. of our entire mileage, and with by far the greater number of our roads so located that they have to take care of a traffic for which waterbound macadam is not suitable, the task of getting a perfect system of highways is very largely a task of reconstruction. About 66 miles of road are now completely worn out and about 110 miles in addition to the 66 miles worn out show very noticeable defects. There is a demand for \$2,000,000 for reconstruction, but since we do not expect to do all the work of reconstruction in one year we feel that an appropriation of \$300,000 for maintenance, including reconstruction, in addition to the automobile fund, is reasonable as well as necessary."

#### The First Reinforced Concrete Bridge.

Des Moines, Ia.—The first reinforced concrete bridge ever constructed in the United States was built at Rock Rapids in 1893. It spans Rock river and although built twenty-three years ago is in good condition now. The bridge was designed by Frederick von Emperger, who was a friend and representative of Prof. Melan, who introduced the system of Melan arch bridges. Assistant Attorney General Henry Sampson, who has just returned from New York City, where he has been investigating the subject of bridge patents, has collected a mass of material with reference to bridge building. In tracing back Von Emperger's activities he has established the facts with reference to the bridge at Rock Rapids.

#### Convicts to Stay on Highways.

Asheville, N. C.—That the convicts now employed on roads in western North Carolina are to be permitted to remain here was the promise made here by Governor Locke Craig, who had come from Raleigh especially to investigate the proposed removal of the convicts from several of the roads in this section for the purpose of hiring them out to private interests. Governor Craig explained that he thought good roads in this section would benefit the entire state, especially as the roads on which the convicts are at work comprise part of the state highway leading to Tennessee and across the state in the other direction.

#### Extends Seedling Mile Offer.

Detroit, Mich.—That the Lincoln Highway Association is satisfied in the results obtained during the past season through its policy of establishing seedling miles of concrete Lincoln Highway to standard Lincoln Highway specifications, is proved by the announcement which has been sent out from headquarters to the county consuls of the Lincoln Highway Association, in the States of Illinois, Iowa and Nebraska. The association urges upon the different counties to take immediate action in making formal application for allotment of free cement which has been set aside for counties in each of the states named. Substantially the association's offer is to provide, with no expense to the county, 3,000 barrels of cement, an amount

equivalent to about \$3,000, to any county who will make use of this cement under the conditions and imposed specifications provided for the construction of a permanent mile of official Lincoln Highway, the funds for the construction work being provided either by the county or township or through local subscription. The association established during 1915 the first two miles of hard-surfaced road in the State of Nebraska, one being near Kearney and the other near Grand Island.

#### Test Constitutionality of Road Law.

Little Rock, Ark.—Suit contesting the constitutionality of the Alexander road law, enacted by the last legislature, has been filed in the supreme court on appeal from a test action instigated in Craighead county.

#### Studying Changes in Specifications.

Harrisburg, Pa.—The assistant engineers of the State Highway Department were summoned to the headquarters of the department at the state capitol by chief engineer W. D. Uhler for the purpose of discussing with him the revision of the specifications to be used by the department during the balance of the present administration. Chief engineer Uhler is not satisfied with the specifications used by the department in the construction of highways and he has spent considerable time this fall in revising and amending these specifications. In order that he might have the consensus of opinion of his assistants, Mr. Uhler called the meeting and divided the fifteen assistant engineers, together with the office engineers, into committees to discuss and analyze various phases of the specifications. Day and evening sessions were held.

#### Township Commissioners Must Not Work on Roads.

Springfield, Ill.—Township highway commissioners violate the law when they use their own teams and draw compensation themselves for working on the roads, except that they may draw the \$2 per day allowed them by law for supervising the work of others, according to an opinion rendered by Attorney General P. J. Lucey. There have been numerous complaints by citizens on this score. The ruling of Mr. Lucey will make it difficult in some localities to get sufficient teams and men to do the work as farmers are not particularly anxious to hire their teams out for this purpose. One plan suggested is that the township commissioners employ some man to do all of the road work in their township and that he take charge of furnishing the men and teams to do the work as directed by the commissioners.

#### To Fight Highway Tax.

Madison, Wis.—The decision of the city council to test the constitutionality of the highway tax law which levies on this city 36 per cent. of the cost of all highway improvements in Dane county, may develop a very complicated legal situation. The 1916 budget includes a sum slightly over \$47,000 for highway improvements. It is the payment of this sum that the city will resort to the courts to evade. As the sum is included in the budget it must be raised and held pending the decision in court litigation as to whether the legislature acted within its constitutional rights in passing such a law. Consequently every tax receipt will have to be stamped "Paid Under Protest" at the city treasurer's window and the amount protested, no matter how small, will be stipulated. The councilmen thought the payment of one citizen's highway tax under protest would be sufficient to bring the matter into court if he would lend his

name to the action. However, it is now believed that every taxpayer who protests his payment will have to bring suit against the state to establish grounds for his objection. It is not likely that separate actions will be filed but that all taxpayers will be mentioned as plaintiffs against the state.

#### New Viaduct Completed.

Sacramento, Cal.—The concrete roadbed of the Yolo causeway is now complete and A. B. Fletcher, engineer of the State Highway Commission, accompanied by his assistant engineer, G. Winslow, drove the first automobile across the \$400,000 structure. The causeway extends from the west levee of the West Sacramento holdings across the Yolo Basin to a point near Webster, a distance of three miles. The causeway consists of a trestle that spans the lands that are flooded during the rainy season and makes traffic impossible. On the west end of the trestle, for a distance of 2,000 feet, the structure is built of timber, as it is temporary work, pending proposed reclamation work. This causeway is the connecting link in the highway on the west side between Sacramento and San Francisco. All of the road between here and the Bay City has been completed with the exception of a ten-mile strip in Solano County. Work on this structure started in July, 1914. This job is one of the largest that has been done by the highway commission. The opening of this causeway is expected to divert a heavy travel through Sacramento as it will permit the only state highway crossing by bridge between here and Butte County. It has been announced that the causeway should be open to general traffic by February 1.

## SEWERAGE AND SANITATION

#### Water Origin of Typhoid Epidemic.

Lake Charles, La.—Dr. Oscar Dowling, president of the State Board of Health, has been investigating the typhoid epidemic situation here, and has sent Louis Alberta, inspector of the board, to examine the markets, slaughter pens, and all places handling fresh meats, and J. H. O'Neil, sanitary engineer, to make a further survey of the water supply. Up to date there have been reported 153 cases of typhoid fever in Lake Charles and 15 in West Lake, which is practically a suburb, making a total of 168. There are sick at present in both places 90. There have been 12 deaths, 3 of these in West Lake. Investigation has been made and the case history taken of 138 patients. "Evidence as to the cause of the infection points to the water," says Dr. Dowling. "During September and October a number of specimens from the city supply were examined in our laboratories. After repeated analyses permits to the railroads to use the city water were issued. The city supply is obtained from artesian wells, but in case of fire water from the river is added. This can be made safe by proper treatment and the equipment necessary was installed by the company after condemnation of the water by our board. From lack of supervision the treatment process evidently was not properly carried out."

#### Low Typhoid Rate.

Providence, R. I.—Despite the epidemic of infected milk cases last fall, the typhoid fever death rate in Providence in 1915 was the lowest ever recorded here. Figures compiled by Superintendent of Health Chapin show the rate to have been 8.4 per 100,000 population. This is 2.2 lower than the 1914 rate, which was considered very low. A total of 241 cases of typhoid were reported during the year, of which 21 resulted fatally. This is 33 fewer cases and five fewer deaths than in 1914. Dr. Chapin's figures indicate that the death rate from typhoid in Providence has shown a steady and marked decrease in the past 60 years. In the period from 1856 to 1865, the rate was 69 per 100,000, and this figure has been steadily cut until the 1915 mark of 8.4 has been reached. There have been two main causes for this remarkable decrease, Dr. Chapin states. The first and most important is the establishment of the municipal water supply, beginning in 1871, and the abandonment of surface wells, which were a prolific source of typhoid. The second

step has been the general abolition of privy vaults, following the development of the municipal sewer system in the early nineties. One important source of infection still remains, Dr. Chapin says, namely, impure milk. During the last 10 years 374 cases and 18 typhoid deaths have been traced directly to the milk supply. The way to eliminate this source, Dr. Chapin holds, is to force the pasteurization of all milk sold in the city. The following shows the death rate per 100,000 living by 10-year periods for 60 years: 1856-1865, 69; 1866-1875, 67; 1876-1885, 57; 1886-1895, 42; 1896-1905, 21; 1906-1915, 12.

#### Diphtheria Epidemics.

Fremont, O.—Fumigation of all theatres and school buildings in the city has been ordered by Health Officer Vermilya in an effort to check the threatened spread of diphtheria in the city. Seven cases have been discovered in the schools.

Middletown, N. Y.—The vigorous work of the board of health is showing its effect in the reduction of new diphtheria cases in the epidemic here. Health Officer Hanover has decided that the origin is in contaminated milk from three farms following examinations by City Chemist Irving C. Bull. Thirty cases were reported within two weeks. Antitoxin is being freely used.

#### People Favor Mosquito Extermination.

Newark, N. J.—An overwhelming vote that the Essex County Mosquito Extermination Commission continue its work, resulted from the post card canvass conducted by the commissioners, according to Secretary William Lee's returns. Of 950 return cards sent out to addresses selected at random from the telephone directory, 279 came back. Only five of those who signed favored the abolition of the commission. Many added words of commendation. Unanimous approval was extended a report by John W. Dobbins, chief inspector, which recommended that the board of education of Newark be asked to set aside a short period on a day to be selected as "Mosquito Day" for the education of school children in matters pertaining to extermination. Mr. Dobbins was authorized to make all arrangements, which are to include the supplying by the commission of larvae, instructive matter and pictorial exhibits.

#### Smallpox Epidemic Sweeps County.

Grainfield, Kan.—Unless quarantine orders by the state board of health were made immediately effective, the town of Grainfield, Gove county, was threatened with complete isolation, following reports that quarantines had not been enforced in 123 cases of smallpox. Complaint was made by Dr. R. R. Stoner, Gove county health officer. Schools in Grainfield have been closed for six weeks. The local officials have been unable to enforce the quarantine, and persons in contact with those suffering from the disease have flagrantly violated the laws. Some have boarded trains and left the city.

## WATER SUPPLY

#### City a Heavy Consumer.

Springfield, Mass.—The water commissioner's report shows total earnings during 1915 amounting to \$466,916.92, but instead of the usual increase over earnings of the preceding year this represents a total decrease of \$4,800. The total includes \$392,287.35 for net water charges to private consumers, \$74,557.97 for water used by the municipality and not paid for, and \$71.60 for water used by the water department and charged in its operating expenses. The falling off in the past year is credited to the heavy rainfall the past summer with a consequent small use of city water for sprinkling for domestic users and a decreased demand by industrial and commercial consumers in consequence of the general business depression. The report includes the usual recommendation that the several municipal departments pay for the water they use. This request, however, is supplemented by a vote of the directors

of the board of trade that "they recommend to the water commissioners that all water service be metered; that the city pay for its water, and that the present differential rate be equitably adjusted." The following tabulation shows the estimated and metered amounts of such used during the past year. The estimated quantity is charged on basis of 5 cents per 100 cubic feet, or 6 2/3 cents per 1,000 gallons:

Classification.	Amount.	Gallons.
Schools .....	\$12,781.13	†191,716,950
Public buildings (except schools).....	2,094.10	†31,411,500
Public parks .....	1,141.60	†17,124,000
Public playgrounds .....	152.00	*2,283,000
Merg reduction plant .....	7,334.15	110,012,250
Building purposes (street and sewer departments) .....	1,058.35	*15,875,250
Street sprinkling (many streets now oiled) .....	1,359.64	*20,394,600
Sewer department (flushing).....	5,650.00	*84,750,000
Watering tanks & drinking fountains.	710.00	*10,650,000
Total of above.....	\$32,280.97	484,214,550
Fire hydrant service.....	42,275.00	.....
Total municipal use .....	\$74,555.97	.....

\*Unmetered. †Partly metered. ‡As shown in register's report.

The total cash receipts during the past year from all sources (including sales of labor and material) were \$430,417.17. The amount collected for water was \$395,046.41, or practically the same as for the year preceding. The total additions to the plant, property and equipment during the year amount to the sum of \$71,125.28. The total operating revenue was \$392,358.95, and the gross income was \$229,296.33, from which was deducted the interest on the funded debt of \$79,305.04, which gave a net income of \$149,991.29. The operating expenses of all the sources of supply totaled \$35,161.59 and the transmission expenses totaled \$3,229.65. The distribution expenses totaled \$36,848.78. The assets are given as \$5,649,489.43 and the surplus as \$458,643.27.

#### Water Works Improvements Defeated.

Fort Worth, Tex.—The proposed issue of \$500,000 of water department bonds has been defeated by a majority of fifteen votes, 854 in favor, against 869 in opposition. The completion of the conduit was the first of the series of improvements in the system that Mayor Tyra hoped to make, should the bond issue have become available. J. C. Lord, superintendent of the water department, stated that his department would continue under its present system of operation as long as was possible or until some other source of supply becomes available. At present the city mains are carrying a mixture of artesian and Clear Forks water. The river water is pumped from the stream and filtered near the Holly pumping plant.

#### Defect in Catskill Aqueduct Tube.

New York, N. Y.—A new defect has been discovered in the Catskill Aqueduct. Fine cracks have developed in a quarter-mile section of the city tunnel extending in Manhattan. Engineers of the board of water supply, in making the final tests of the work, found that it would not be safe to open the tunnel with these faults, and ordered that the section be repaired. It is estimated that the work will cost at least \$150,000. In order to cause as little tearing up of the present work as possible a novel method is proposed. The plan is to leave the tunnel itself intact and place within it a thin copper lining. In spite of this device, the work will be attended with great difficulties, as the tube is far below the street, and it will be necessary to tear up pavement and covers and remove valves to get access to the section. The trouble is said to be due to the presence of some springs which were not discovered when the tunnel was first laid and for which no allowance was made. It is believed these springs since began to flow and caused seepage into the tunnel. It is expected that the work can be done in five or six months. The tunnel at this point is twelve feet. The specifications call for the use of copper lining 5-64 of an inch in thickness. The sheets are to be joined by brazing and attached to the surface of the existing concrete lining by bolts fastened into the masonry. After completion the tightness of the brazed

joints is to be tested by light water pressure on the back of the copper lining.

#### New Dam Accepted.

Temple, Tex.—Following an official inspection of the new dam by the city council and the water commission, the structure was accepted. P. G. Burns, of Houston, was the contractor. The approximate cost of the dam is \$18,000. It is 15 feet high, 180 feet long, 22 feet wide at the base and 11 at the top.

#### No Charge for Water Used for Sprinklers.

Raleigh, N. C.—Commissioner of Insurance James R. Young is very pleased with the action of the city commission of Raleigh in adopting a rule that provides free water for the installation of automatic sprinklers for fire protection. Raleigh is the first municipality in the state to take such action. It means that any manufacturing or mercantile plant in the city can install the automatic sprinkler service and incur no extra expense as to water supply. Commissioner Young wants all other cities and towns in the state, which own their own water plants, to follow Raleigh's lead in this matter.

#### Mains Break in Two Cities.

Harrisburg, Pa.—The entire city was for 45 minutes without any water supply, following the most serious breaking of a water pipe that has occurred in years here. Had a fire occurred there would have been no water pressure during the time and the fire department would have been helpless. Users of water, however, suffered only temporarily, for as soon as Superintendent of Public Safety Bowman was notified of the break he ordered out the entire water department force and temporary repairs were made at once. The break occurred at a by-pass pipe, running between a main leading from the reservoir and a twenty-inch main. Until the water was shut off 1,500,000 gallons of water poured out and flooded the streets.

Seattle, Wash.—A large wooden pipe that conducts water from Cedar lake to Seattle for the municipal water supply was broken for a distance of 150 feet for three days in Maple valley by a washout following leaking that undermined the conduit. Strenuous efforts were made to restore the line and the work was done as quickly as possible. The Volunteer park reservoir, which has a storage capacity of 23,000,000 gallons, was drained, but no inconvenience was suffered, as when the break occurred all the reservoirs, having a total storage capacity of 250,000,000 gallons, were full. The normal consumption in Seattle is 25,000,000 gallons daily.

## STREET LIGHTING AND POWER

#### City Settles Franchise Suits.

New York, N. Y.—The city, through Corporation Counsel Hardy and Controller Prendergast, has settled its litigation with four electric companies over their special franchise taxes for 1913, 1914 and 1915 for an aggregate sum of \$3,442,662. The companies involved are the New York Edison Company, the United Electric Light and Power Company, Brush Electric Illuminating Company and the Consolidated Telegraph and Electrical Subway Company. According to the corporation counsel the settlement of these tax cases is one of the best ever made by the city, from a financial point of view, as well as being the largest in amount in the history of the city. The total tax levied against the four companies was \$3,177,764 for the three years. The amount the companies finally paid for the three years was \$3,140,485, a reduction from the original tax levy of only \$37,279. In addition to the principal, the city receives \$302,176 in interest, the rate being 7 per cent a year. Because they waited from one to three years to obtain a reduction of \$37,000 in their taxes, the companies have thus lost \$265,000. To make good the deficiency in its tax collections, due to the companies withholding their taxes, the city had to borrow money at the rate of 3 or 3 1/2 per cent, and in the settlement the city draws interest at

least double the amount it was forced to pay on its borrowings, the difference in rates of interest amounting to about \$135,000 in the city's favor. Both the Controller and the Corporation Counsel consider that these figures compare well with the actual reduction in the taxes of \$37,279, which the city conceded in the settlement. Of the total amount of taxes, the New York Edison Company pays about two-thirds. For three years its taxes amounted to \$2,210,029. In the settlement the company agreed to pay its 1913 and 1914 taxes in full and obtained a reduction of about \$29,000 in its 1915 tax. The final sum of taxes it agreed to pay was \$2,181,031, in addition to \$214,151 in interest. The companies filed writs of certiorari to review the action of the Board of Assessors in the courts immediately after the taxes were levied. A settlement out of the courts was suggested, and after the experts from the Finance Department had examined the books of the companies, the corporations offered to settle the taxes for an aggregate of \$3,054,517. The city's financial experts contended that this figure was too low and finally induced the companies to raise their figures to a total of \$3,140,485, as finally agreed upon, an increase of almost \$100,000.

#### **Detroit Left Without Heat, Light and Water.**

Detroit, Mich.—Detroit's downtown district was without heat, light and water for several hours when fires and explosions in the mains of the Edison Illuminating company burned out the electric feed wires, and needle ice at the waterworks intake pipe cut off the low pressure water supply. The accident stopped elevators, put out lights and shut down machinery. The failure of the water supply stopped steam heating and steam engines and made washing a luxury. The fires were caused by explosions of gas in sewers. The damage amounted to about \$25,000 and weeks may be required to put the underground system in order. The water shortage was not ended until nearly noon, when a crew of men on a tug, hurriedly chartered by the water commission, succeeded in breaking up most of the troublesome ice.

#### **The Kansas Gas Fight.**

Topeka, Kans.—Judge Flannely in the Montgomery County district court granted the cities of Independence and Coffeyville restraining orders enjoining receivers of the Kansas Natural Gas Company from putting into effect the increased rate of 23 cents a thousand for natural gas, recently ordered by the state utilities commission. Independence objected on the ground that the order of the commission was "wholly without any right, warrant or authority in law," was made without due notice to citizens, without allowing them a day in court to present evidence and was wrongful, unlawful, arbitrary and discriminatory. The Coffeyville complaint was similar.

Meanwhile, the Kansas Supreme Court has been hearing the arguments of the attorneys on the question of whether or not the court should allow the mandamus and injunction suits against the receivers of the Kansas Natural Gas Company to be removed to the United States District Court. The public utilities commission is contesting the removal and contends that mandamus suits cannot be removed to a federal court from a state court. It is contended that the removal should be by an appeal direct to the Supreme Court of the United States. The commission has asked that the receivers be compelled to furnish sufficient gas.

In addition to this litigation, suits have been brought in the District Court of Shawnee County by the cities of Atchison, Topeka and Lawrence, seeking to restrain the Kansas Natural Gas Company, the distributing companies and the Utilities Commission from compelling them to pay for gas burned in the municipal buildings.

#### **Big Improvements for Coast Utility Company.**

San Francisco, Cal.—The Railroad Commission has issued an order authorizing the Pacific Gas and Electric Company to issue \$2,500,000 par value of first preferred stock and \$2,000,000 face value general and refunding gold bonds. The first preferred stock must net the company \$90 a share and the bonds 85 per cent face value plus accrued interest. The funds received from the sale of the stock and of the

bonds are to be used to reimburse the company's treasury for plant expenditures to Aug. 31, 1915, in the sum of \$491,744.43, and pay for extensions, additions and betterments in the sum of \$3,150,000. This amount, the company estimates, will have to be spent because of the development of its business and the foreseen addition of new consumers in 1916. The estimate was based upon the past records of the company, and no details have been submitted to the commission. Not any of this money is to be paid out until the commission approves the bills. The company operates in north central California, in San Francisco, and the counties of Butte, Sierra, Yuba, Colusa, Sutter, Nevada, Placer, Yolo, Sacramento, Solano, Napa, Amador, Calaveras, Tuolumne, Mariposa, El Dorado, San Joaquin, Sonoma, Marin, Contra Costa, Alameda, San Mateo, Stanislaus, Santa Clara, Santa Cruz, San Benito and Merced. It has generating plants of 172,010 kilowatts electricity and gas plants of 2,156,500 cubic feet an hour. It owns 1,535 miles of high tension transmission lines. Its overhead distribution lines amount to 3,711 miles, it has 463 miles of underground cable and 726 miles of wires. The company's gas mains total over 2,500 miles. It has 150,000 electric consumers, 220,000 gas consumers and 9,000 water consumers, besides selling steam for heating purposes in San Francisco and Oakland, and operating a street railway in Sacramento. The authorized capital stock is \$160,000,000. At the end of last November, the company had a surplus of over \$4,000,000, and its net operating revenues were nearly seven and one-half millions. The profit for the eleven months of 1915 was close to \$4,000,000.

#### **Light Plant Profitable Investment.**

Iola, Kan.—The municipal electric light plant is shown to be a good investment for the city in a report made by George Freeman, commissioner of finance. With a sliding scale of from two to four cents per kilowatt hour, for commercial and domestic consumers, the plant has returned a net profit of nearly \$10,000 for the twelve months on an investment of \$58,000. Improvements have been made which bring the valuation of the plant to \$72,339. In addition 122 street lights are maintained for which no charge is made. The city's original investment in the plant was a bond issue of \$10,000. Recent improvements have made it possible to take on large users of current, including the United States Smelting Company, which uses a minimum of \$200 per month.

## **FIRE AND POLICE**

#### **Fire Record of the Panama-Pacific Exposition.**

San Francisco, Cal.—The fire loss within the exposition grounds from the time construction began until the exposition closed did not exceed \$250, according to a report filed by chief engineer Thomas R. Murphy with the fire commission. "This record is remarkable and highly creditable to the fire department, considering the exposed condition of the site and the nature of the structures, which covered 635 acres," the report says. At Chicago the World's Fair fire loss was \$478,000 and at St. Louis, \$100,000, chief Murphy states. Seven companies, with motor apparatus, were kept on the exposition grounds, and they responded to 117 alarms. Chief Murphy reports an increase in the number of fire alarms in the city. In the year 1915 there were 3,141 alarms responded to by the fire department, while in 1914 there were 2,606 alarms.

#### **Ten Firemen Injured.**

Somerville, Mass.—Ten firemen are suffering from injuries which they received at a fire which caused \$100,000 loss at the Sprague Hathaway Company's factory in West Somerville. The factory, which was four stories high, of brick and about seventy-five by one hundred feet, was filled with the inflammable materials used in making portraits and picture frames, and the fire spread quickly. This fire caused the heaviest loss in Somerville for a quarter-century. Chief Rich also pointed out that the loss this time is more than double that for the entire year 1915. After the fire was under control the 1,000-gallon water tank on the top of the

building fell and knocked out a section of the wall above the fourth floor. Men from Engine 1 and Hose 5 were on ladders and the fire-escape on this side and were hit by the falling bricks. Arthur S. Mahood, a hoseman, was knocked off a ladder and fell thirty feet. His spine was hurt and he is believed to have internal injuries. George Johnson and Everett Bray, who were higher on the same ladder, escaped injury, except for a bad cut on Bray's hand. T. L. Deegan had three ribs broken and contusions, V. S. Littlefield had his scalp and shoulders hurt. D. J. Collins had two fingers fractured, and D. M. O'Connell had his hand injured, Lieutenant L. E. Seymour had his back and leg injured. Captain E. F. Tretren, Lieutenant R. W. Jesson and E. J. White of Hose 5 had just manned a new line of hose and all were shaken up, cut and bruised by bricks and mortar.

#### Fire Prevention Study Gift to State.

Harrisburg, Pa.—"Desiring to express a recognition of the debt which a higher institution of learning owes to the community," a group of Bryn Mawr college alumnae, in commemoration of their twenty-fifth anniversary, have announced a gift to the state in the form of a study of fire prevention. The study is to be devoted to industrial establishments in this state where women are employed. The Pennsylvania Department of Labor and Industry has accepted the direction of the study in behalf of the public. The work is to be carried on by Miss Fanny Travis Cochran, assisted by Miss Florence Lucas Sanville. One of the objects of the study will be to rouse public sentiment against factory fire hazards.

#### Fire Cuts Off Light and Power.

Orland, Cal.—Orland spent a night and a day without electric lights or power, as a result of a fire that destroyed the Associated Oil Company's station here and an adjoining structure. The flames, carried across the street by the wind, burned a pole carrying the high voltage transmission lines that supply the city and broke the wires. The cutting off of the power crippled the Orland waterworks, the pumps being operated by electricity. No hardships resulted, however, the city's large water tank being filled to capacity. Plenty of water was available for fire fighting. The origin of the fire is unknown. The direction of the wind saved several warehouses and lumber yards. The explosion of tanks and tins of kerosene, distillate and lubricating oil threw columns of flame in all directions. The supply of gasoline, which is kept in an underground tank, was untouched by the flames. Haveline & Co., state highway contractors, lost several pieces of road-building machinery when the fire spread to the building in which the machinery was stored. Another small building in which asphalt has been prepared for surfacing the highway, several times was threatened, but escaped with only a scorching.

### MOTOR VEHICLES

#### Hook and Ladder Does Well in Tests.

Auburn, N. Y.—The new motor driven hook and ladder truck purchased by the city for the fire department has been given its official trials with Mayor Chas. W. Brister on the seat beside the driver. The truck responded in a splendid manner to very severe tests, and the city officials were greatly impressed. Besides Mayor Brister, fire commissioner William C. Burgess and fire chief E. J. Jewhurst rode on the truck, with the special agent of the American-La France Fire Engine Co., Elmira, which constructed the machine. The most striking test of all for the powerful motor was made on Lincoln street hill. The car proceeded easily to the middle of the hill, the steepest in the city, and there the driver brought it to a stop. The wheels heavily chained, rested in snow and on a frozen path. The driver started the engine and the heavy apparatus, from a standing start, despite ice and snow, was soon at the top of the hill, having made the climb with no trace of difficulty. Going down Genesee street hill on the west side, the brakes were applied and the truck stopped quickly on the grade.

The chains gripped and there was no sliding. The big truck is equipped with a powerful six-cylinder motor, developing 100 horsepower and capable of producing a speed of fifty-five miles an hour.

#### City Receives New Ambulance.

Oskaloosa, Ia.—The new city ambulance has been received and put into commission. It is a 1916 Haynes, 7-passenger machine, equipped with Goodyear tires. The motor is 6-cylinder, 55 h.p.

#### Hook and Ladder Truck Arrives.

Racine, Wis.—The new American-La France auto hook and ladder truck, purchased by the city at a cost of \$5,200, has arrived and been inspected by Mayor T. W. Thiesen, the ward aldermen and many of the other city officials. The truck has a 106-horsepower motor and is capable of making a speed of sixty miles an hour. An important feature of the new truck is a life net, which measures six feet across. In addition to this, the equipment includes pipes, cellar nozzles, battering rams, shovels, hose shutoffs and 250 feet of regulation ladders, measuring from 50 to 12 feet in length. Within a few months another new piece of motor apparatus—a chemical and hose auto for the Fourth ward station—will arrive in the city. When this comes there will only be two pieces of horse-drawn fire apparatus in the city.

#### Motor Apparatus Saves Money.

Salt Lake City, Utah.—Recognition of the greater efficiency of motor-driven as compared with horse-drawn apparatus and the attendant saving of nearly 30 per cent in maintenance and operation is a feature of the annual report of W. H. Bywater, fire chief. Chief Bywater estimates, as the result of investigation during the year, that the installation of motor-driven apparatus at fire headquarters has increased efficiency fully 50 per cent. At the same time facts and figures show that it costs 30 per cent less to furnish gasoline, oil and sundries required by motor-driven apparatus than it costs to feed and care for horses. The report calls attention to the fact that during the past year a complete machine shop has been installed at fire headquarters, including a compressor for the care of motor-driven apparatus. A charging battery has also been installed.

### GOVERNMENT AND FINANCE

#### Optional City Government Law Unconstitutional.

Albany, N. Y.—The mainspring of the optional city government law relating to the powers of cities operating under this form of government to pass ordinances to supersede or repeal existing charter provisions, has been declared unconstitutional by attorney-general Egbert E. Woodbury. The opinion is the result of an exhaustive study of the law made by the attorney general and Deputy Attorney General Harold J. Hinman. Two cities, Niagara Falls and Newburgh, are now operating under one of the five plans provided by the optional government law, the city manager plan, and the effect of the opinion will be to send the officers of these cities back to the legislature for additional charter changes. The legislature on the other hand may find it desirable so to amend the optional city government law as to provide a complete form of government under each of the five simplified plans, similar to the second class cities law. The legislature in enacting the optional government law simply provided an outline of the machinery of government for a city adopting one of the simplified plans and left to the elected council of the city the determination of what other officers and employees were necessary for the administration of the affairs of the city, the prescribing of their duties and the passage of ordinances superseding and repealing charter provisions regulating such matters. The question whether the existing charter shall take effect in any, all or no cases, was left to the judgment and discretion of the council without either check or guidance. The attorney general held that the legislature cannot secure relief from its duties by such a general delegation of its powers. The constitutionality of the law was

raised in an inquiry made by the city of Niagara Falls as to the power of the new council to change the title of the "overseer of the poor" to that of "commissioner of charities." The attorney general held that the council could not make the change. The council's actions will now have to be legalized.

#### City Managers Begin with Trouble.

Sandusky, O.—The city commission took from City Manager Ward the power to appoint his private secretary and named one for him, of whom he did not approve. The commissioners are already divided into factions and heated discussion followed by "straight" voting is the routine of any attempt on the part of the manager to make appointments. This question was not taken up specifically in the charter.

Ashtabula, O.—Fred A. Briggs, elected city manager January 3 under a new charter form of government, has sent his resignation to council. Briggs was elected when he broke a deadlock by voting for himself, and in view of an opinion from City Solicitor C. R. Hogue that his action was illegal and because of general wave of protest by newspapers and citizens Briggs said he would decline to serve.

#### The Taxation of Rolling Stock.

Richmond, Va.—The Supreme Court of Appeals of Virginia has handed down a decision affirming an order of the State Corporation Commission, in the famous rolling stock case. The decision means that the cities and counties of Virginia will share, according to mileage, the taxes received from railroads and other public service corporations on their rolling stock. The several cities in the state in which headquarters of the various roads are maintained, and which cities received all of the revenues from the tax on rolling stock fought the order of the commission and carried the case to the highest court.

#### The Debt of Springfield, Mass.

Springfield, Mass.—The annual statement of the city's debt and sinking funds has been made public by city treasurer E. T. Tift. It shows a total bonded debt of \$8,950,600, and a total of \$1,246,389.38 of sinking funds. The serial bonds are being paid off rapidly, especially the large issues for the Little River water system. The bonds for the municipal group also will be considerably reduced in the next few years. Most of the bonds now outstanding have been issued since 1900. The principal exception is the issues of \$125,000 and \$150,000 for improvements in the Ludlow water system, which were made in 1890 and 1893. The last of the bonds now outstanding, one of the municipal group bonds, will be paid off in 1954.

#### State May Make City's Assessments.

Denver, Colo.—The supreme court of the United States has decided that the Colorado tax commission and the state board of equalization have the power to demand a 40 per cent increase in the assessed valuation of Denver in the case brought against the commission by the Bi-Metallic Investment Co. This case was appealed from a decision of the state supreme court. The decision is very important. The city council will have to add \$55,000,000 to the assessed valuation of the city this year. If the program previously outlined is followed out, the city council and the school board will cut their levies, so that the only increase in actual cash collected for running the government would be \$116,352, which would go to the state. This, of course, is based upon the assumption that the city and county and school levies would be cut to meet the emergency, while the state levy would not be cut. The Bi-Metallic case was brought to test the tax commission's right to make horizontal increase over an assessor's valuation by arbitrary order. The company contended that this act deprived the company of property without due process of law. The attorney general defended the suit, which involved 1914 taxes. Attorney General Farrar stated that he would prosecute his mandamus suit to force Commissioned Pitcher to raise his assessment if the latter did not heed the United States supreme court decision.

## STREET CLEANING AND REFUSE DISPOSAL

#### Cost of Garbage Collection.

Peoria, Ill.—The free collection of garbage by the city department, vastly increased in amount during the year 1915. A total of 18,868 loads, amounting to 28,302 tons, were handled. This work was done with 15 teams at a cost of \$1.16 $\frac{3}{4}$  per load, including the overhead expense of office, superintending, etc. Superintendent Elliott has so systematized his work that four loads a day are averaged by the teams, making 60 loads in all, and the entire city is included at least once a week. He is asking for five more teams and wagons for 1916. Garbage collection cost about \$27,000 during 1915, which includes new horses and equipment.

#### City Cannot Force Sidewalk Cleaning.

New York, N. Y.—With the failure of certain citizens to clear the snow and ice from their sidewalks the authorities discovered that there is no adequate manner of punishing the offenders for their neglect. A prevalent neglect on the part of the property owners is due to the fact that the old ordinance compelling householders to clean the sidewalks in front of their dwellings has been supplanted by one which has no terrors of fine and imprisonment. Before March 30 last the ordinance provided that the police should notify owners of residences, and also of vacant lots, to clean the sidewalks in front of their premises. If this was not done, the offenders were summoned before a magistrate, and if adjudged guilty were fined from \$1 to \$3 each, or even imprisoned for a day, or both. The aldermen, during recodification, changed the ordinance last summer to one which provides that in each of the five boroughs when a citizen neglects to clean his sidewalk the borough president shall have it cleared and certify the cost of the operation to the corporation counsel. The neglectful citizen is duly summoned on a complaint and sued for the services of the city. If he loses, he must pay the cost of the cleaning, the maximum charge for which is set at \$3. Corporation Counsel Hardy states that the city cannot collect even a \$3 penalty without approximately \$25 costs, and often it is impossible, even to serve the guilty property owner. The process of collecting is laborious, and if a householder be found to neglect his shoveling duties continuously he must be sued on separate actions. The situation is regarded as very serious. The restoration of the old ordinance is urged.

#### Farmers May Not Take Garbage.

Syracuse, N. Y.—Justice Leonard C. Crouch has rendered a decision in favor of the Syracuse Reduction Co. in the action brought against the city of Syracuse over the disposal of garbage. The decision enjoins the city from permitting unlicensed persons to transport garbage through the streets, and forbids the collection or transportation of Syracuse garbage through the streets by anyone other than the agents and employees of the city as designated by the commissioner of public works. The decision is upon an action started in 1910 and as the result of the alleged failure of the city to live up to the terms of a contract made with the reduction company two years prior to that time. By its terms, the decision also grants an order requiring the city to deliver all garbage of the city to the reduction company. The contract made in 1908 contained the following clause: "The city agrees to deliver into receptacles prepared for it at the plant of the Syracuse Reduction Co. all the garbage it may lawfully collect from day to day." According to the terms of the complaint, it is a common practice for farmers to come into the city with wagons, and, after taking the garbage, transport it through the streets to their farms. A great deal of this comes from downtown hotels and restaurants and is composed of meat fats and other waste materials valuable to the reduction company for its by-products. The court ruled the city lawfully is entitled to collect this garbage, and, by the terms of the decision, must in turn deliver it to the reduction company. Justice Crouch scored the menace to the public health ensuing from the present manner of collection.

## LEGAL NEWS

### A Summary and Notes of Recent Decisions— Rulings of Interest to Municipalities

#### Amount of Bond Issue—Determination—Increase.

*Uhler v. City of Olympia.*—The amount of a bond issue for the purchase of municipal waterworks must be determined by the citizens, and the city council cannot depart from their determination in any material degree, nor can the courts authorize a material increase.—Supreme Court of Washington, 152 P. R., 998.

#### Grading Part of Street—Damages.

*Hollenbeck et al. v. City of Seattle.*—Where to meet immediate necessities part of a street only is graded, the city is not estopped from grading the remainder of the street, and an abutting owner cannot recover damages for injuries from such grading, though it deprived his land of lateral support.—Supreme Court of Washington, 153 P. R., 18.

#### Improvement of Street—Continuing Right—Abuse.

*J. A. & C. E. Bennett v. Winston-Salem South-Bound Ry. Co.*—The right of a municipality to further grade and improve its public streets is a continuing right, which may be exercised in its legal discretion whenever the public needs may require it, and which cannot be interfered with by the courts, except in case of manifest and gross abuse, or when arbitrary or oppressive.—Supreme Court of North Carolina, 87 S. E. R., 133.

#### Defective Ways—Knowledge of City—Liability.

*Eagan v. City of Covington.*—Where plaintiff, while walking along a street partly submerged by an overflow, was injured by falling into a week-old water hole created by a previous overflow, which defect had not rendered the sidewalk unsafe until the day of the accident, and the municipal authorities had no notice or reasonable opportunity to learn of its dangerous condition, the city was not liable, since a municipality is not liable for injuries from defects in its ways unless it has actual or constructive notice thereof.—Court of Appeals of Kentucky, 179 S. W. R., 1026.

#### Rights of Taxpayers—Requiring Firemen to Paint Apparatus.

*Marsch v. Leibert et al., Board of Fire Comrs.*—As the theory of a taxpayer's action is that the taxpayer as the ultimate bearer of the burdens of the municipality shall have a remedy against illegal official acts tending to waste the property of the public, a taxpayer is not entitled to an injunction to restrain the board of fire commissioners from requiring firemen to paint engine houses and apparatus, on the ground it would expose them to turpentine when they might be called to fires; it appearing that the painting was required in good faith for the purpose of economy.—Supreme Court, Special Term, Erie County, 155 N. Y. S., 1083.

#### Regulation of Street Railways—Annexation of Territory—Effect.

*People ex rel. Dwight v. Chicago Rys. Co. et al.*—Where a township by ordinance accepted by a street railway created a contract between it and the railway establishing the conditions under which the latter might maintain its lines in the township's streets, when a portion of the territory of such township was annexed to a city jurisdiction over the streets and alleys of the territory vested immediately in the city, and the township no longer had control of them, and the city, with the consent of the railway company, could change the contract embodied in the ordinance respecting the use of streets, or make an entirely new contract to impose other or additional conditions upon which the company should thereafter use the streets in the annexed territory or to relieve the company entirely from the performance of the conditions attached to the grant by the township.—Supreme Court of Illinois, 110 W. E. R., 394.

#### Statutes—General and Special Provisions.

*People ex rel. Knoblauch v. Warden of Jail of Fourth District Magistrate's Court.*—Where one of the two provisions of the same act is special and clearly indicates a particular matter, and the other is general and would, if standing alone, include the same matter and thereby cause a conflict, the special provision will be construed as an exception to the general provision.—Court of Appeals of New York, 110 W. E. R., 451.

#### Injury to Pedestrians—Liability—Governmental Functions.

*City of Louisville v. Hans.*—A municipal corporation cannot escape liability for the negligence of its servants on the ground that the functions in the performance of which the negligence occurred were governmental functions, where the negligence was failure to remove a garbage can from the sidewalk within a reasonable time; for such negligence is merely a violation of the duty to exercise ordinary care to keep the city streets and sidewalks in a reasonably safe condition for public travel.—Court of Appeals of Kentucky, 180 S. W. R., 65.

#### Incurring Indebtedness—Limit.

*Holmgren v. City of Moline et al.*—Though the Act of 1913 amending Acts 1891, Sec. 6, relating to public hospitals, is valid in so far as it authorizes the issuance of warrants in the nature of bonds by the hospital board, yet the inhibition of Const. Art. 9, Sec. 12, against indebtedness exceeding 5 per cent. of the value of the taxable property is in force, and warrants which would bring the total municipal indebtedness beyond that limit cannot be justified on the ground that they were to be paid out of a special fund created out of taxes for hospital purposes.—Supreme Court of Illinois, 109 N. E. R., 1031.

#### Public Improvements—Acceptance of Work—Liens.

*Red Wing Sewer Pipe Co. v. City of Pierre, et al.*—Pol. Code, Sec. 1366 (Laws 1903, Chap. 213, Sec. 18), provides that work on any contract for the construction of sewers shall be approved by a vote of the council, and applies to all contracts for sewerage systems, whether under the immediate sections of the statute or under sections 1341-1345, which provide a different method for letting the contracts, so that, although the city engineer attempts to accept work for the city, the date of acceptance is that, when the council acts, and on a mechanic's lien on a fund due the contractor filed in time, action to foreclose may be brought within 30 days of the time the council acts, and not within 30 days of the time the city engineer acts.—Supreme Court of South Dakota, 154 N. W. R., 712.

#### Street Improvements—Fraud—Judgments.

*State ex rel. Bradway v. De Mattos, Mayor, et al.*—A city made street improvements to be paid for by warrants drawn on a local improvement district fund, secured by assessment of property in each district, but, by reason of a general failure by property owners to pay assessments and of warrant holders to enforce liens, the several funds were wholly inadequate to pay the warrants. Thereupon the city compromised the claims by agreed judgments with the warrant holders upon complaints alleging that the city had failed to pay the local funds for street intersections and special benefits, and had wrongfully paid local warrants out of their order, whereby there was no money in the fund to pay the warrants, to which the city answered, admitting liability and consenting to judgment. On such judgments the city issued general indebtedness warrants, for the payment of which the city had no funds. When the judgments, which aggregated \$69,000, were entered, the city was indebted beyond the constitutional limit, the indebtedness for street intersections and special benefits was \$25,000, the practical value of the settlement doubtful, and it was the declared law of the state that special improvement assessments could not be a general liability against a city because of its failure to provide and collect the special fund. Held, that the judgments were void for constructive fraud on the part of the city officials in knowingly imposing on the city an illegal liability.—Supreme Court of Washington, 152 P. R., 721.

## NEWS OF THE SOCIETIES

### Calendar of Meetings.

Feb. 2-5.—INDIANA ENGINEERING SOCIETY and the INDIANA WATER SUPPLY AND SANITARY ASSOCIATION. Annual convention. Claypool Hotel, Indianapolis, Ind. Secretary, Chas. Brossman, 1616 Merchants' Bank Building, Indianapolis, Ind.

Feb. 4, 5.—AMERICAN ELECTRIC RAILWAY ASSOCIATION. Seventh annual midyear meeting, Chicago, Ill.

Feb. 10-12.—MINNESOTA SURVEYORS' AND ENGINEERS' SOCIETY. Annual meeting, St. Paul.

Feb. 12-19.—NINTH CHICAGO CEMENT SHOW. First Infantry Armory and Coliseum, Chicago, Ill. Secretary, Robert F. Hall, Cement Products Exhibition Co., 208 South LaSalle street.

Feb. 15-18.—SECOND NATIONAL CONFERENCE ON CONCRETE ROAD BUILDING.—Secretary, J. P. Beck, 208 S. LaSalle St., Chicago, Ill.

Feb. 17, 18.—AMERICAN CONCRETE PIPE ASSOCIATION. Annual convention, Chicago, Ill.

Feb. 22, 23.—ARKANSAS ENGINEERING SOCIETY. Annual meeting, Helena, Ark. Secretary-Treasurer, W. J. Parkes, Citizens' Bank Bldg., Pine Bluff, Ark.

Feb. 28-March 3.—AMERICAN ROAD BUILDERS' ASSOCIATION. Thirteenth annual convention, including sixth American Good Roads Congress and seventh National Good Roads Show of Machinery and Materials, Pittsburgh, Pa.

Feb. 29-March 4.—TENTH ANNUAL MID-WEST CEMENT SHOW, Omaha, Neb.

March 23, 24.—FLORIDA STATE GOOD ROADS ASSOCIATION. Annual convention, St. Augustine.

May 8-10.—SOUTHWESTERN WATER WORKS ASSOCIATION. Annual convention, Waco, Tex. Secretary, E. L. Fulkerson, Waco, Tex.

May 10-17.—NATIONAL CONFERENCE OF CHARITIES AND CORRECTIONS.—Annual conference, Indianapolis, Ind.

June 4-8.—AMERICAN WATER WORKS ASSOCIATION. Thirty-sixth annual convention, New York, N. Y. Secretary, J. M. Diven, 47 State Street, Troy, N. Y.

June 15, 16.—OHIO SOCIETY OF MECHANICAL, STEAM AND ELECTRICAL ENGINEERS. Convention, Cleveland, O. President, Joseph L. Skeldon, Toledo.

Sept. 6-9.—LEAGUE OF AMERICAN MUNICIPALITIES. Annual convention, Newark, N. J.

### The Cement Show.

As in previous years, the ninth cement show which is to be held at Chicago, February 12-19, will be the great annual market place for concreting machinery and equipment, but the ninth show will offer visitors the most varied display of concrete products that has ever been brought together.

With machinery men busy with displays of equipment, it is naturally the duty of the cement manufacturers to look after products displays. With twenty-eight cement companies exhibiting, twice the usual amount of concrete products might be expected. But these companies have combined in an effort to show the possibilities of concrete, thereby eliminating all duplication of effort and at the same time concentrating upon an exhibit which will bring forth the latest and best of concrete construction. Nor have the machinery men been overlooked in the effort to bring products into the show. Every exhibitor has been urged to display the products of his machine.

Concrete has become the standard in

many phases of engineering work, and in a multitude of other fields its use is generally recognized. But the possibilities of concrete for decorative purposes have thus far been subordinated to its wider use in actual construction. The purpose of the display of concrete products at the show is to demonstrate that concrete can be used logically for beauty as well as for strength.

The joint exhibit will have on display samples of an exceptionally wide variety of concrete surfaces. Walls large enough to show the appearance of concrete in large areas, full-sized duplicates of the balustrade in Grant Park to show architectural design, carved decorative panels from the Hollenden Hotel in Cleveland, the building stone so widely used in the East, and concrete simulating the finest of granites and marbles will be the features of the joint exhibit which will interest architects most. An effort will be made to instruct visiting builders in modern treatments of concrete surfaces.

An important part of the joint exhibit will be the road display. The United States Government road models which were exhibited at the Panama-Pacific Exposition will be a feature of the concrete road division which should prove interesting to road builders. Full size pavement sections built to show road inspectors and contractors the errors of construction to be avoided will be well worthy of careful study.

One section of the joint exhibit will be devoted to good versus bad concrete. A 2,000-pound testing machine and other laboratory apparatus will be used to show that graded materials are more economical and make better concrete than bank run aggregates.

Builders who visit the show to study equipment, however, will have ample opportunity to investigate the standard machines of the industry. More comprehensive displays of equipment are possible because of the greater amount of display space which the armory offers. Concrete mixers, block and brick machines, engines, pumps, hoists, crushers, forms for monolithic concrete, machines for sewer pipe and drain tile, road building and contractors' equipment will be shown in greater number and variety than last year.

There will be five big general divisions in the joint exhibit.

(1) The road division will contain models, actual sections and ample data to give the visitor a clear conception of concrete pavement types. A recent government model showing the method of road building will be particularly interesting. Another model contrasting paved and unpaved alleys should make clear that the building of concrete alleys is an important move for civic betterment.

(2) The structural and decorative division will show examples of interior and exterior decoration, as intricate in

character as the Hollenden Hotel (Cleveland) panels. Cast concrete specimens typical of the work which architects, particularly in the East, are using in distinctive work, will be shown. Surfacing with special aggregates and with characteristic treatments will be displayed in a manner which will show both the finished surface and the processes of production. Photographs and charts to bring out the lessons of the Edison and Salem fires will be shown in this booth.

(3) The rural contractor division will bring out the possibilities of concreting in rural districts. With the demand for concrete already created, the small town contractor should find the farm exhibit of especial benefit.

(4) The concrete unit division will treat of the methods of surfacing concrete units. The processes of bringing out the colors and brilliance of aggregates should interest architects and builders. A unit bungalow designed by one of Chicago's foremost architects will be the feature.

(5) The good concrete division will demonstrate by means of a 2,000-pound testing machine and other laboratory apparatus that a better and more economical concrete results from the use of graded aggregates than from bank run materials. Full-sized cylinders of clean and unclean aggregates will be used in the tests.

Joint exhibitors are: Aetna Portland Cement Co., Detroit, Mich.; Alpha Portland Cement Co., Easton, Pa.; Atlas Portland Cement Co., New York; Burt Portland Cement Co., Bellevue, Mich.; Castalia Portland Cement Co., Pittsburgh; Chicago Portland Cement Co., Chicago; Crescent Portland Cement Co., Wampum, Pa.; Diamond Portland Cement Co., Cleveland; Dixie Portland Cement Co., Chattanooga, Tenn.; German-American Portland Cement Works, La Salle, Ill.; Huron Portland Cement Co., Detroit, Mich.; Ironport Portland Cement Co., Ironport, O.; Kosmos Portland Cement Co., Kosmosdale, Ky.; Lehigh Portland Cement Co., Chicago; Louisville Cement Co., Louisville, Ky.; Marquette Cement Mfg. Co., La Salle, Ill.; Michigan Portland Cement Co., Chelsea, Mich.; Newaygo Portland Cement Co., Grand Rapids, Mich.; Northwestern States Portland Cement Co., Mason City, Ia.; Peerless Portland Cement Co., Union City, Mich.; Peninsular Portland Cement Co., Jackson, Mich.; Sandusky Portland Cement Co., Cleveland; Union Sand & Material Co., St. Louis, Mo.; Universal Portland Cement Co., Chicago; Wabash Portland Cement Co., Detroit, Mich.; Wolverine Portland Cement Co., Coldwater, Mich.; Wyandotte Portland Cement Co., Wyandotte, Mich.

### National Civic Federation.

The convention of this association was held at Washington, D. C., Jan. 17-18. Officers were re-elected as follows:

Seth Low, former mayor of New York, re-elected president; First vice-

president, Samuel Gompers; second vice-president, Benjamin Ide Wheeler, and treasurer, Isaac N. Seligman.

#### International Association of Fire Engineers.

A meeting of the directors of this association has been called by President Marston for Feb. 8 at Providence, R. I. At this meeting the date for the annual convention will be selected and a program of topics to be discussed will be arranged.

#### Indiana Sanitary and Water Supply Association and Indiana Engineering Society.

These two associations will hold joint meetings at Indianapolis, Feb. 2-5. The sessions of the Water Supply Association will open on Feb. 2 and the program is as follows:

Wednesday, February 2, 2 P. M.—President's Address, J. N. Hurty, State Health Commissioner, Indianapolis, Ind.; Report of Secretary-Treasurer, W. F. King; Report of Committee on Water Works Devices and Machinery, E. C. Elliott, Supt. Kokomo Water Co.; Operation of Water Works Plants, D. J. Toyne, Supt. Water Department, South Bend; Frozen Soil Conditions as Affecting Water Services, J. B. Marvin, Consulting Engineer, Frankfort, Ind.; Laboratory Tests of Lead Service Pipe, R. B. Wiley, Prof. of Sanitary Engineering, Purdue University; Round Table Discussion: Cleaning Small Water Reservoirs, Experiences with Water Meters, The Use of 16-Inch Cast Iron Pipe for Water Works.

Thursday, February 3, 9 A. M.—Report of Committee on Water Purification, W. H. Durbin, General Manager Water Dept., Evansville, Ind.; New Filtration Plants in Indiana, John C. Diggs, Chemist State Board of Health, Indianapolis, Ind.; The Chemistry of Water Purification, C. K. Calvert, Chemist Indianapolis Water Co. Indianapolis, Ind.; Experimental Studies of Strawboard Waste Purification, H. B. Hommon, Chemist United States Public Health Service, Cincinnati, O.; The Preparation of Antityphoid Vaccine, Severance Burrage, Biologist Eli Lilly Co., Indianapolis, Ind.; Sanitary Survey of Logansport and Noblesville, Ind., H. F. Barnard, State Food and Drug Commissioner, Indianapolis, Ind.

Thursday, February 3, 2 P. M.—Report of Committee on Water Works Management and Accounts, H. O. Garman; Advertising a Public Utility, Merle Sidener, President Sidener-Van Riper Co., Indianapolis, Ind.; Report of Committee on Legislation and Legal Decisions, H. E. Barnard; The Business and Economic Importance of Vital Statistics, Dr. Cressy H. Wilbur, Statistician New York State Health Department, Albany, N. Y.; The Health of the Southern States, Dr. Chas. W. Stiles, Surgeon United States Public Health Service, Washington, D. C.

Thursday, February 3, 7:45 P. M.—One Hundred Years Progress in Public

Health Administration, Dr. W. F. King, Asst. State Health Commissioner of Indiana; The Sanitation of the Panama Canal, W. C. Gorgas, Surgeon-General U. S. A.; One Hundred Years Progress in Water Supply, W. G. Ulrich, Indianapolis Water Co.; One Hundred Years Progress in Engineering, W. K. Hatt, Professor of Civil Engineering, Lafayette, Ind.

The Friday meeting will be in connection with the Indiana Engineering Society. The joint programs are:

9 A. M.—Report of Committee on Appraisals, H. O. Garman, Indianapolis, Ind.; Efficiency in the Utility Plant, Charles Brossmann, Consulting Engineer, Indianapolis; Municipal Ownership, Yes or No? F. F. Chandler, Chandler & Taylor Co., Indianapolis, Ind.; Method of Measuring Consumers' Electric Demand, E. T. Selig, United Gas and Electric Eng. Corporation, New York City; Handling Coal by the Car Dump Method, Scott W. Linn, Pres. The Cavanaugh-Linn Co., Cleveland, O.; Efficiency of Hand-Fired Furnaces, E. B. Smith, Marion Machine & Foundry Co., Marion, Ind.

2 P. M.—Report of Committee on Sewage Disposal, R. B. Wiley, Lafayette, Ind.; Sewage Treatment by the Activated Sludge Process, T. Chalkley Hatton, Chief Engineer, Milwaukee Sewage Commission; Tax Reform in Indiana, Eben H. Wolcott, State Tax Commissioner of Indiana; The Present Status of Water Purification by Rapid Sand Filters, Philip Burgess, Burgess & Long, Columbus, Ohio; Difficulties of Commission Regulation of Public Utilities, H. O. Garman, Chief Engineer, Indiana Public Service Commission.

The Indiana Engineering Society will begin its meetings on Thursday. The program is:

Thursday, Feb. 3, 2 P. M.—Report of Secretary, President's Address, E. H. Ahara; Specifications and Construction, H. A. Blunk, Martinsville, Ind.; Concrete Sewer Construction in South Bend, W. E. Graves, South Bend, Ind.; Compression Members for Small Stresses, Albert Smith, Professor Structural Engineering, Purdue University; Road Building and Inspection, A. P. Melton, Gary, Ind.; Report on Concrete Roadway at Indiana University, U. S. Hanna, Professor of Mathematics, Bloomington, Ind.; Standardization of Gravel for Concrete, C. C. Brown, Indianapolis; Reports of Committees, Surveying, Drainage, Roads and Pavements, Legislation, Bridges, Mining, Water Works, Stream Pollution.

Thursday, February 3, 7:45 P. M.—Joint Meeting of Indiana Engineering Society and Indiana Sanitary and Water Supply Association; One Hundred Years Progress in Public Health Administration, Dr. W. F. King, Assistant State Health Commissioner of Indiana; The Sanitation of the Panama Canal, W. C. Gorgas, Surgeon-General, U. S. A.; One Hundred Years Progress in Water Supply, W. G. Ulrich, Indianapolis Water Co.; One Hundred Years

Progress in Engineering, Prof. W. K. Hatt, Lafayette, Ind.

The Friday sessions will be held in connection with the Indiana Engineering Society. The program for that day is given above.

Saturday, February 5, 9 A. M.—Tests of Concrete with an Admixture of Hydrated Lime, H. H. Schofield, Professor of Civil Engineering, Purdue University; Traffic Study Data, Prof. D. D. Ewing, Professor Electrical Engineering, Purdue University, Lafayette, Ind.; Bituminous Mastic Fillers for Block Pavements, J. S. Crandall, Engineer, Barrett Mfg. Co., Chicago, Ill.; Testing High Voltage Insulators, C. F. Harding, Professor Electrical Engineering, Purdue University; Routing—Its Significance, L. W. Wallace, Assistant Professor Locomotive Design, Purdue University, Lafayette, Ind.; Reports—Electrical Engineering, Central Station Light and Power, Electric Railroads, Steam Railroads, Mechanical Engineering, Architecture, Reinforced Concrete Buildings, Masonry and Concrete in Mass, Materials of Construction; Reports of committees; Unfinished business.

## PERSONALS

Marsh, Clarence W., consulting and chemical engineer, Boston Safe Deposit & Trust Company Building, 201 Devonshire street, Boston, Mass., announces his establishment as an independent consulting and chemical engineer, prepared to render service as investigator, adviser and organizer for the chemical and allied industries. His intimate personal knowledge of the manufacture of electrolytic caustic soda, bleach and chlorine products will be available to clients. He has had twelve years' practical experience as chief engineer and special investigator, and as director for the Hooker Electrochemical Co. and the Development and Funding Co. of New York.

The Aetna Engineering Bureau, civil and sanitary engineers, 17 N. La Salle Street, Chicago, Ill., announces that, beginning January 1, the name of the firm is changed to Marr, Green & Company. There will be no other change in the personnel, organization or business of the firm.

Bruce, Capt. F. W., has resigned as engineer of the port commissioners of Jacksonville, Fla.

Hodge, Henry W., one of the best known engineers in the country, has been appointed a Public Service Commissioner of New York by Governor Whitman. He succeeds Robert C. Wood, who resigned.

Churchill, Louis, has been appointed engineer of Garwood, N. J.

Griffin, John H., has been appointed city engineer of Gloucester, Mass.

Deputy, Owen C., is now chief of police of Milford, Del., succeeding former Chief Baker.

# NEW APPLIANCES

Describing New Machinery, Apparatus, Materials and Methods and Recent Interesting Installations.

## NEW COMBINATION. Hose and Chemical Wagon for Waukesha, Wis.

The city of Waukesha, Wis., has recently installed a combination chemical and hose wagon of interesting construction. The chassis is a standard Sterling two-ton, worm-gear driven, made by the Sterling Motor Truck Company, Milwaukee, Wis., and the superstructure and auxiliaries were built by the Peter Pirsch Company, Kenosha, Wis. The chassis is equipped with a  $4\frac{1}{2} \times 5\frac{3}{4}$  motor, instead of the standard  $4 \times 5\frac{3}{4}$ , and a special four-speed transmission and  $6\frac{1}{2}$  to 1 gear ratio, so as to give adequate power and speed for fire department service. The machine can therefore make a speed of 35 miles an hour or better.

The Sterling worm-gear-driven rear axle is of the semi-floating type. The entire load and the strains on the axle are borne by a heavy nickel steel solid shaft, designed to stand six times the maximum possible load. The Sterling semi-floating type is claimed to be of simpler, stronger and more durable construction than full-floating axles. The axle is automatically self-adjusted and no other attention is needed than keeping the housing supplied with oil by filling about every 4,000 miles of service.

All parts of the mechanism are housed against the contact of dirt and water. The design throughout is simple and claimed to result in economy in maintenance and repair.

Some of the more detailed specifications and the claims of advantages of them follow:

**Cylinders and Pistons.**—Best semi-steel, tested five times in manufacture.

**Crank Case.**—Very heavy section copper aluminum alloy.

**Valves.**— $3\frac{1}{2}$  per cent. nickel alloy, split washer, taper type, flat case hardened end.

**Crank Shaft.**—Chrome nickel steel, heat-treated, tensile strength 140,000 pounds.

**Connecting Rod Bearings.**—Reinforced

backs, Fahrig metal lining, semi-steel and 35 carbon steel.

**Cooling System.**—All bronze centrifugal water pump, brass water piping.

**Lubricating System.**—Automatic splash system; connecting rod establishes oil level regardless of motor position.

**Ignition.**—Use of single instead of dual ignition eliminates the storage battery. The Sterling-Eisemann automatic

unit power plant and is easily accessible by removal of the metal floorboards of the cab.

**Transmission.**—Special four speed instead of the regular three speed transmission. Selective sliding gear type. Gears have one inch face and are made of  $3\frac{1}{2}$  per cent. nickel steel.

**Steering.**—Steering gear is the Sterling double worm and nut type, the



FOUR 100-POUND RICHARDSON COAL SCALES IN PUMPING STATION, WILWAUKEE, WIS.

advance single ignition system is simple, eliminating four or five sets of wires and keeping number of electrical wires for distributing current down to six. Another advantage of the Sterling-Eisemann single ignition system is that fire equipment is unlike a commercial motor truck in daily service, and therefore the depreciation of the storage battery would be a factor.

**Clutch.**—Sterling dry disc clutch with very large frictional contact surface, faced with anti-burn proof material, is positive in operation. It is housed in the flywheel in an integral point of the

principle of which is similar to that of the worm and worm wheel drive of the final power transmission. This gear gives more than double the contact surface of the ordinary worm and sector type of steering gear in which a point of a tooth may at times have to sustain the entire stress of steering.

**Control.**—Control and operation very simple. Location of spark and throttle levers are on top of the steering column. Automatic action of the ignition system further simplifies control. Foot accelerator enables the driver to control the machine in conjunction with the throttle. Position of brake and speed chain levers immediately to driver's right insure ease of operation.

**Carburetor.**—Sterling-Holley make. One set is positive in its adjustment, containing no springs. Provided with hot-air intake. The graduated dial on the dash allows air adjustment from the seat.

**Brakes.**—Service brakes, internal expanding, the emergency brakes, external contracting type, both located at rear wheels. This position locates the reaction strains from brake application on a solid steel shaft of sufficient strength to withstand these stresses. Braking directly on the rear wheels is quicker, more positive and more reliable. Actuation by means of simple toggle joint levers instead of the ordinary cams.

**Frame.**—Sterling laminated or wood inlaid frame. Heat-treated, pressed chrome nickel steel side plate on the inside of which is



WAUKESHA'S NEW STERLING COMBINATION.

a heavy well-seasoned oak sill. Mechanism of chassis is bolted instead of being riveted to the frame. The tendency of wood inlay of the frame as it shrinks is to grip bolts more securely and loosening of mechanism on the frame is impossible.

**Springs.**—Semi-elliptic type of chrome vanadium steel. Front, 48x2½, rear, 54 x3 inches.

**Axles.**—Front axle heavy I-beam drop forged, nickel steel carefully heat-treated. In the hubs are Standard Roller Bearing Company's best alloy steel bearings.

**Wheelbase.**—Wheelbase 148 inches. Turning circle approximately 65 feet.

**Wheels.**—Second growth hickory artillery tire wheels, 36 inches front and rear. Equipped with Standard Roller Bearing Company's bearings.

**Tires.**—Goodyear special cushion tires guaranteed by makers for 10,000 miles or two years' service. Special rims of demountable type.

**Gasoline Tank.**—Gasoline tank capacity 22½ gallons; oil tank, 3 gallons.

**Body.**—Body constructed entirely of steel, except flooring, and has sufficient capacity to carry 1,200 lbs. ft. of 2½-in. hose, together with seating for eight men. Framework is of No. 12 B & S gauge sheet steel panels, front and sides.

**Lighting and Starting.**—Starting, lighting, and ignition electrical systems of the latest Westinghouse Electric Company's manufacture. Electric generator driven direct from the chassis transmission. This position frees motor from any encumbrances, simplifies the wiring system and, being immediately under the footboards of the cab, can be quickly gotten at for any needed adjustment.

#### COAL WEIGHING MACHINERY. For Receiving and Feeding in Power Plants.

The growing attention to efficiency and economy in power plant operation has discovered that for efficiency to be real it must be continuous and it must

not rely only on periodic tests. This continuous and recorded accurate knowledge of exact conditions can result only from careful weighing and measuring of fuel and water used and results produced. This is the very first principle of successful purchasing and is rapidly becoming a part of the centralized purchasing of municipalities and the operation of progressive municipal and private public utility plants.

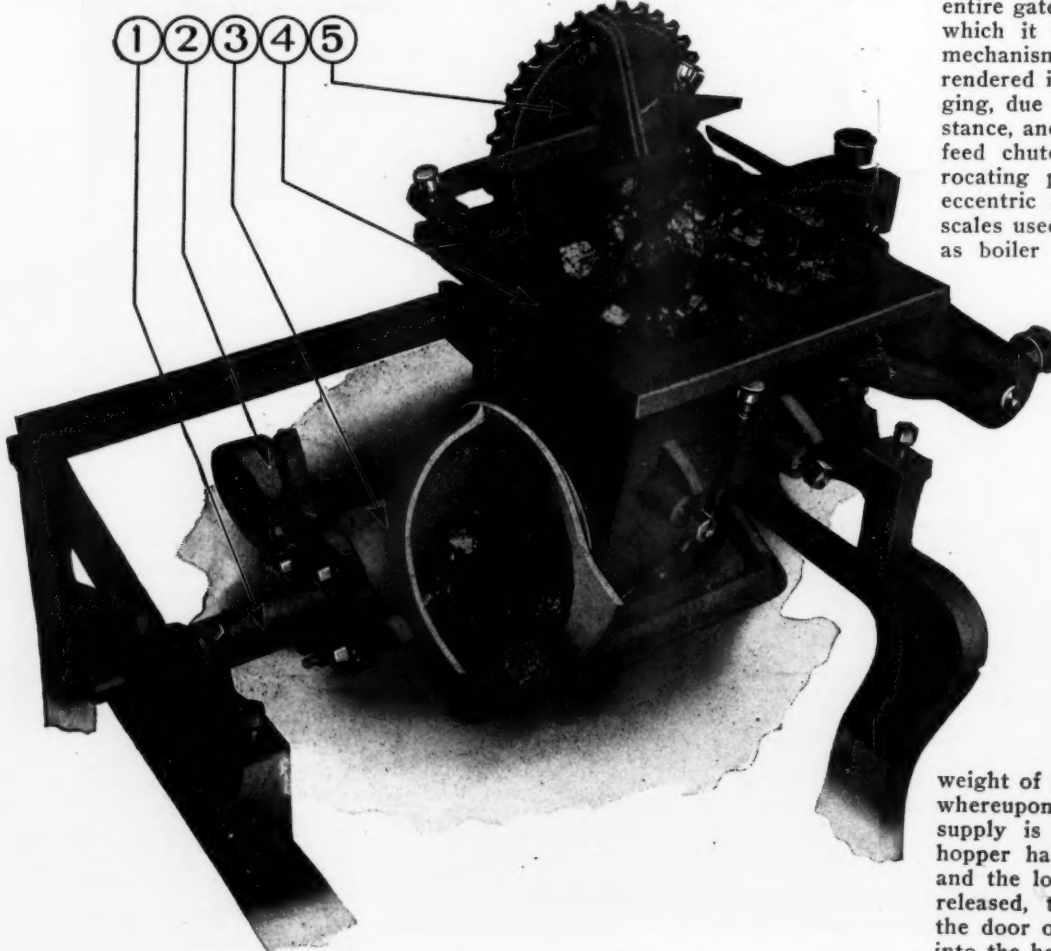
After the class of coal suited to working conditions in a plant has been determined by laboratory tests of values and operating tests it is necessary that the standards worked out be maintained continuously. No system of operation, however scientifically developed, could be of any value if the weights of coal actually received were different from the amounts invoiced. Yet this is notoriously the case. In order that only coal really received be paid for and that accuracy be maintained the coal must be continuously weighed. In order to keep check on the performance of all units so that conditions such as draft, cleanliness of flues, ash and moisture, frequency of firing and the use of unnecessary boilers be in line with efficiency methods the fuel and water delivered to the boiler should also be known continuously.

There are Richardson automatic scales for all these purposes: receiving coal, weighing fuel to boilers and measuring water. The principle in these

three machines is the same, details of construction differing according to needs. In each case the weighing beam is equal armed, so that checking by weights is direct. Other advantages claimed for the equal arm balance are: No need of adjustments; one fulcrum; independence of character of supports or uneven foundations; errors not multiplied because of multiple leverage.

The Richardson automatic scale operates by gravity, the coal being delivered from some point above the scale. It can take charges from hopper, bunker, elevator or conveyor and drop it into a hopper, bin, chute, down-spout, elevator or conveyor. The accompanying illustration shows the feed hopper and gate for a 100-pound per discharge scale. In scales of this size the counter-balance, which operates the gate, is attached directly to the gate itself (as in 2). The gate 3 is a bronze casting finished smoothly to prevent clogging with coal. The coal enters the feed chute 4 through the rectangular inlet and goes down through the chute which is disposed at an angle of about 50 degrees, passing through a circular outlet at a right angle to the inlet into the feed gate 3. The formation of the chute is such that it holds the coal in check and allows it to roll out freely at the bottom; the amount of coal above the scale not affecting the freedom of operation of the gate. The inlet gate has three positions: wide open, dribble and completely closed. The entire gate is mounted on a shaft about which it is rotated by the operating mechanism. In this way blocking is rendered impossible. To prevent clogging, due to small or wet coal, for instance, and to assure even delivery, the feed chute is equipped with a reciprocating plate agitator driven by an eccentric shaft with a sprocket. The scales used for intermittent work, such as boiler charging, have a throw-out gear or clutch which stops the agitator whenever the feed gate is closed because of interruption and throws it back into motion when the feed gate is open again.

From the gate the coal falls into the weigh hopper, which is carried on one end of the equal-arm beam, the weight-box with standard weights being on the other. The power for weighing is derived from the standard weights in the weight-box and the coal in the hopper. The coal continues to fall into the weigh hopper until the weight of coal equals the weight of standard weights in the box, whereupon the beam balances and the supply is cut off. When the weigh hopper has its full draft, it descends and the lock on the discharge door is released, the weight of the coal on the door opening it, and the coal falls into the hopper or other receptacle beneath.



FEED HOPPER AND GATE OF 100-POUND PER DISCHARGE COAL SCALE.

The operating mechanism consists of two sets of levers on the dead center principle—one for the inlet gate and the other for the discharge door and are so interlocked that both cannot be open at the same time. On scales of 200 pounds an operating weight is used to cushion the movement of the weight box and the spring of the feed gate. On 300-pound scales and larger a piston operating weight works in a dust-tight air cylinder and freedom from shock and quiet operation is thus obtained. Because of the interlock, which prevents the inlet gate opening while the discharge is not closed, it is impossible for coal to pass through unweighed in case of accidents or of intent to get more coal than is measured. Each weight is recorded automatically by a six-figured reciprocating engine type springless counter, rust and dust-proof. The scales are so adjusted that the average weighing on a scale in continuous operation are guaranteed correct within one-half of one per cent. A residual or fractional scale may be used for the batch left at the end of the load.

In construction the scale is self-contained. The substantial gray iron sides keep the mechanism braced and aligned. The feed chute is of cast iron with a smooth interior surface. The gate is either of cast bronze or brass plate to eliminate corrosion from moisture and acids in the coal. Friction is reduced by the use of ball-bearings. The beam arms are made of cast steel and the cross-bars of wrought iron and are designed to maintain absolute rigidity under severest load strains. Each knife edge is made of a compound piece of metal, specially welded, the main body being of tough Norwegian iron and the edge of high grade hardened tool steel carefully ground and polished. The lower part of the weigh hopper is of tobin bronze or lined with noncorrosive metal, as is also the discharge door. The weights are of solid cast iron tested to government standards. Levers are of cast iron, pins of bronze. All bearings are fitted with oil cups for proper lubrication.

The scales may be installed in a number of ways adapted to varying conditions, platforms, girders, bunkers, hoppers, chutes, buckets, derricks, conveyors, cars and other devices being used in a number of combinations. The boiler scales may be stationary or portable. Not only may coal be weighed with them, but scales may be used for measuring such materials as crushed stone, clay, cement, sand, etc. In many plants where material is handled on belt conveyors, the Merrick conveyor weightometer is used at the point where the conveyors feed onto each other. The water scale measures by weight on the same principle as the coal scales.

The illustrations show: an installation of a 1,000-pound receiving scale with an hourly capacity of 40 tons in the power plant of the United Electric Light Company at Springfield, Mass.;

four 100-pound removable coal scales in the North Point pumping station at Milwaukee, where the scale is mounted on a truck and moved in front of the boilers.

The scales described are made by the Richardson Scale Company, Passaic, New Jersey.

## INDUSTRIAL NEWS

**Cast Iron Pipe.**—Chicago—Future lettings of 800 tons at Saginaw and 600 tons at Grand Rapids, Mich., 1,500 to 2,500 tons at St. Paul and 300 at Fort Wayne. At Elyria, O., the Massillon Iron & Steel Company is low bidder on 500 tons. Prices advanced \$1 per ton on large pipe and \$2 on 4-inch. Quotations: 4-inch, \$32.50 to \$33; 6-inch and larger, \$29.50 to \$30; Class A, \$1 extra. Birmingham—Number of orders of appreciable size received. Central Foundry Company has resumed furnace of Central Coal & Iron Company at Holt. Prices \$1 higher. Quotations: 4-inch, \$25; 6-inch and up, \$23. San Francisco—Glendale has taken couple of cars of 6 and 8-inch. Whittier has plans under way for \$100,000 waterworks system. Quotations: 4-inch, \$36; 6-inch and up, \$34. New York—Bids opened by Baltimore, Md., on 5,810

tons of 1½ to 48 inches, mostly smallest and largest sizes. Other bids have been opened by New Britain, Conn., on 155 tons; Lynn, Mass., 700 tons, and Brookline, Mass., 481 tons. Quotations: 6-inch, Class B and heavier, \$29; Class A, \$30.

**Lead.**—Quotations: New York, 5.90 cents; St. Louis, 5.70.

**Warren Brothers Company,** 142 Berkeley street, Boston, Mass., has issued an attractive new catalog, "Warren's Portable Asphalt Plant," describing the development of the plant and explaining and illustrating in detail its construction and operation. Examples of a few of its many installations are shown, among them being those for the cities of Chicago, Ill. (railroad type plant); Victoria, B. C. (semi-portable type plant); Montreal, Ont. (stationary plant); St. Louis, Mo. (stationary plant); and New York City (Brooklyn), N. Y. (stationary plant).

**The American Gum Products Company,** 200 Fifth avenue, New York, announces that its secretary and general manager is now **Gordon I. Lindsay**, for several years New York agent for the Robeson Process Company. The American Gum Products Company manufactures sulphite pitch.



1,000-POUND RECEIVING COAL SCALE, UNITED ELECTRIC LIGHT COMPANY, SPRINGFIELD, MASS.

# ADVANCE CONTRACT NEWS

## ADVANCED INFORMATION BIDS ASKED FOR

## CONTRACTS AWARDED ITEMIZED PRICES

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also correction of any errors discovered.

## BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
<b>STREETS AND ROADS</b>				
Fla., Jacksonville	..... 2 p.m., Jan.	29..	Paving brick for 20,000 to 35,000 sq. yds., of pavement...	J. C. Odell, Gen. Mgr. Realty Building
Wis., Milwaukee	...10.30 a.m., Jan.	29..	Furnishing 10,000 bbls. Portland cement, 20,000 gals. of paving cement and 15 tons of asphaltic cement...	F. G. Simmons, Comr. Pub. W. City Clerk
Wis., Tomah	..... 10 a.m., Jan.	31..	Grading, draining and laying conc. or brick pavement...	August Hohenstein, Pur. Agt. County Commissioners
Minn., St. Paul	...10.30 a.m., Jan.	31..	Curbing several streets	L. G. Burgess, City Clerk
Ala., Hamilton	..... Jan.	31..	Graveling 10 miles of road	Wallace Treichler, City Engr.
Kans., Larned	..... Feb.	1..	Constructing 2 miles of paving	G. A. Bingham, Gen. Mgr.
Ill., Rock Island	..... Feb.	1..	Paving with brick, estimated cost \$74,475	E. J. Blackin, Secy.
Mass., Norwood	..... 6 p.m., Feb.	1..	Furn. 400,000 granite pav. blks. & 3,000 bbls. Port. cement	A. E. Bowers, Secy, Selectmn.
Ill., Chicago	..... 11 a.m., Feb.	1..	Constructing cinder sidewalks	S. R. Williams, City Clerk
Conn., Manchester	..... Feb.	1..	Constructing concrete sidewalk and curb, estimated cost \$25,000	J. E. Buland, City Clerk
Ia., Missouri Valley	..... Feb.	1..	Laying 40,000 sq. yds. of brick, concrete, vertical fibre brick, tarvia or bitulithic	J. M. Boniface, Co. Aud.
Ia., Storm Lake	..... Feb.	1..	Constructing about 60,000 yds. pavement	B. C. Brandstadt, Sec. Bd. Loc. Impts.
Ill., Galva	..... Feb.	1..	14,000 yds. brick pavement and 5,600 ft. curb and gutter	Comr. of Pub. Works.
Ind., Portland	..... Feb.	1..	Constructing several roads	J. D. Laughlin, Clk. Co. Supvs.
Ill., Oak Park	..... 4 p.m., Feb.	1..	Grad., pav. with asphaltic conc. on a conc. foundation and constructing curbs and gutters	County Engr.
Mont., Butte	..... 7.30 p.m., Feb.	2..	Paving streets with wood block, bitulithic or asphaltic concrete	Douglas Mathewson, Pres. Boro of Bronx.
Tenn., Jackson	..... 10 a.m., Feb.	2..	Maintaining novaculite roads in county	County Commissioners
N. J., Paterson	..... 1.2 p.m., Feb.	2..	Installing creosote floor and wearing deck on bridge	H. F. Kelley, Ch. Bd. Pub. W.
N. Y., New York	...10.30 a.m., Feb.	3..	Grading, setting and laying sidewalk	F. G. Simmons, Comr. Pub. W.
Fla., Miami	..... Feb.	3..	Constructing cross state highway through Everglades	J. N. Drew, Engineer.
Wis., Manitowoc	..... 11 a.m., Feb.	3..	Paving with brick, asphalt, wood block or asphaltic conc.	Board of Public Service.
Wis., Milwaukee	..... Feb.	4..	Street paving	W. H. Borgen, Clerk.
Fla., Dunedin	..... Feb.	4..	13,300 yards of paving and 14,000 ft. of concrete and granite curb	H. H. Howe, Co. Aud.
Mo., St. Louis	..... Noon, Feb.	4..	Paving several streets with vitrified brick	J. A. Farrell, Comr.
Minn., Duluth	..... 11 a.m., Feb.	5..	Improving several streets	S. R. Sizelove, Co. Aud.
S. D., Sioux Falls	..... 2 p.m., Feb.	5..	Grading 1 1/2 miles of road	A. P. Denton, Co. Engr.
Minn., Duluth	..... 11 a.m., Feb.	5..	Improving streets	J. J. Albertson, Co. Engr.
Ind., Kentland	..... 2 p.m., Feb.	7..	Constructing macadam road	J. A. Syphrit, Twp. Clerk.
Wash., Seattle	..... Feb.	7..	Const. three miles of permanent highway, cost \$30,000	J. H. M. Morrison, Ch. Co. Rd. Coms.
N. J., Camden	..... 11 a.m., Feb.	7..	Const. 13,782 yds. bitu. pavement on mac. foundation; requires 10,000 yds. of excavation	J. C. Greggs, Co. Aud.
Ia., Wapello	..... Feb.	7..	Road work and dragging for 1916	A. R. Holden, Co. Auditor
Tenn., Tazewell	..... 11 a.m., Feb.	7..	Grading and macadamizing about 30 miles of road	G. J. Ries, Co. Aud.
Ind., Franklin	..... Feb.	7..	Constructing gravel road, 14,466 ft. long	H. J. Rhue, County Auditor
Ind., Rushville	..... Feb.	7..	Constructing 12,600 ft. of road	J. M. Allen, County Auditor
Minn., St. Paul	..... Feb.	7..	Furnishing 10-ton steam or gasoline road roller	J. C. Barbe, County Auditor
Ind., Greensfield	..... 10 a.m., Feb.	7..	Constructing gravel road	Roy Slater, County Auditor
Ind., Green Castle	..... 2 p.m., Feb.	7..	Constructing 6 miles macadam road	G. J. Bernhart, County Aud.
Ind., Greensburg	..... 1 p.m., Feb.	7..	Constructing several roads	Clarence Sedgwick, Co. Aud.
Ind., Newport	..... 10 a.m., Feb.	7..	Constructing county road	J. H. Morrison, Ch. Rd. Comrs.
Ind., Vernon	..... 11 a.m., Feb.	7..	Constructing stone road	J. T. MacMurray, City Clerk.
Ind., South Bend	..... 11 a.m., Feb.	7..	Grading, draining and paving with concrete	W. W. Friberger, Twp. Clerk.
Tenn., Tazewell	..... Feb.	7..	Grading and macadamizing 29 miles of road	I. L. Miller, Clk. Co. Supvs.
N. J., Plainfield	..... 8 p.m., Feb.	7..	Furnishing 115,000 gals. refined tar for treating streets	F. C. Johnston, Clk. Twp. Trustee.
N. J., Elizabeth	..... 8 p.m., Feb.	7..	Furnishing crushed trap rock, 2,500 tons	E. P. Kircher, Co. Aud.
Cal., Bakersfield	..... Feb.	7..	Furnishing 19,000 bbls. asphaltic oil	C. A. Palmer, First Nat'l Bk., Cleveland
Ia., Columbus Junction	..... Feb.	7..	Road construction	F. C. Dewey, Co. Aud.
Ind., Wabash	..... Feb.	8..	Constructing gravel roads in three townships	W. O. Horton, County Aud.
O., Shaker Heights	..... Noon, Feb.	8..	Paving with brick, concrete, asphalt or bitu. macadam	E. A. Smith, County Aud.
Ind., Angola	..... 2 p.m., Feb.	8..	Improving 12 miles of road	County Auditor
Ind., Noblesville	..... 10 a.m., Feb.	8..	Constructing concrete and gravel road	W. L. Benson, Co. Auditor.
Ind., Rochester	..... 2 p.m., Feb.	8..	Constructing two roads	Cleve Goodwin, Co. Auditor.
Ind., Decatur	..... Feb.	8..	Constructing macadam roads	Dr. W. F. Batman, Co. Aud.
Ind., Kokomo	..... 10 a.m., Feb.	8..	Grading, paving and improving roads	I. L. Miller, Clerk. Bd. Supvs.
Ind., Lebanon	..... 10 a.m., Feb.	8..	Grading, paving and improving roads	F. K. McElhenny, Co. Aud.
Ind., Crawfordsville	..... Feb.	8..	Constructing five gravel roads	T. A. McLaughlin, Co. Aud.
Cal., Bakersfield	...10.30 a.m., Feb.	8..	Const. three sections of county hwy.; requires 97,000 sq. yds. concrete pavement	T. A. McLaughlin, Co. Aud.
Ind., Peru	..... Feb.	9..	Constructing gravel road	F. M. Williams, Co. Auditor.
Ind., Columbia City	..... 1 p.m., Feb.	9..	Constructing three gravel roads	C. D. Nims, County Engr.
Ind., Columbia City	...2.30 p.m., Feb.	9..	Constructing county road	W. H. Scott, Co. Aud.
New Zealand, Dunedin	..... Feb.	9..	48,000 sq. yds. wood block, rock asphalt or asphalt paving	T. A. McLaughlin, Co. Aud.
Ind., Muncie	..... 10 a.m., Feb.	9..	Constructing gravel roads	F. A. Housheer, Co. Auditor.
Wash., South Bend	..... 10 a.m., Feb.	9..	Grading and draining road and constructing bridges	County Auditor.
Ind., Columbus	..... Feb.	9..	Constructing crushed stone roads	Z. T. Merritt, Clerk. Co. Comrs.
Ind., Columbia City	..... 10 a.m., Feb.	9..	Constructing township road	F. M. Holcomb, Co. Clerk.
Ind., La Porte	..... 10 a.m., Feb.	10..	Constructing township roads	C. L. Hunter, Twn. Recorder
Ind., Shelbyville	..... 10 a.m., Feb.	10..	Constructing county line road	
Fla., Miami	..... Feb.	11..	Road construction	
Kans., Kansas City	..... Feb.	14..	Grading and macadamizing road	
W. Va., Bath	..... Noon, Feb.	15..	15,000 yds. concrete or brick paving	

## BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Wis.	Wausau	Feb. 15	Laying 30,000 yds. brick pavement	City Clerk
Wash.	Spokane	Feb. 15	200,000 cu. yds. of excavation and 200,000 sq. yds. of various pavements	J. W. Strack, Co. Engr.
Ia.	Spencer	Feb. 15	Laying 50,000 sq. yds. hard surface pave. cost \$50,000	E. O'Keefe, City Engr.
Minn.	St. Peter	Noon, Feb. 15	Dragging and maintaining state road in Nicollet county	W. H. Holz, Co. Aud.
Minn.	St. Cloud	3 p.m., Feb. 15	Const. 1,800 sq. yds. creosoted wood blk. pave. on bridge	G. G. Magnuson, City Clerk
Wash.	Tacoma	Feb. 20	Const. 8 miles of pavement, estimated cost \$100,000	County Commissioners
N. Y.	Lestershire	8 p.m., Feb. 21	Laying brick pavement and constructing curb	W. C. Lewis, Village Clerk
N. D.	Minot	Feb. 28	Constructing 24,844 sq. yds. first-class pavement	E. J. Thomas, City Engr.
Ark.	Little Rock	Mar. 1	Paving several streets and constructing 48,000 ft. curb and gutter	Dickinson & Watkins, Engra
Kan.	Atchison	Mar. 1	Paving several streets	V. L. King, City Clerk
Wis.	Appleton	Mar. 1	6,000 yards of sandstone paving and 10,000 yards brick, asphalt or concrete	A. C. Remley, City Engr.
Minn.	LeSueur Center	2 p.m., Mar. 6	Five 2 or 4-horse road graders	T. F. Dunn, County Auditor
Ala.	Huntsville	Mar. 6	Constructing 3 1/4 miles macadam road	M. S. Bingham, Rd. Supv.
Wash.	Davenport	Mar. 7	Graveling 13 miles of Sunset Highway	G. G. Harvey, Co. Surveyor
Ill.	Danville	Mar. 14	Constructing 174 miles of county road	P. C. McArdie, Supv. Engr.
Mo.	Bolivar	Mar. 20	Constructing 10 miles oiled gravel roads	G. M. Upton, Secy. Road Dist.
SEWERAGE				
Ind.	Winamac	Jan. 29	Constructing tile drainage ditch	C. E. Paul, Co. Surveyor
Minn.	St. Paul	10.30 a.m., Jan. 31	Constructing sewer	August Hohenstein, Pur. Agt.
Minn.	So. St. Paul	8 p.m., Jan. 31	Constructing about 4,000 ft. 12-in. sewer	J. R. Stevenson, City Rec.
Minn.	Minneapolis	3 p.m., Jan. 31	Furn. 400,000 or 500,000 vit. pav. blks. for sewer const.	K. E. Alexander, City Pur. Agt.
Ind.	South Bend	10 a.m., Feb. 1	Improving streets by constructing pipe sewers	V. Sweeney, Clk. Bd. P. W.
N. J.	Ridgefield Park	Feb. 1	Two sewage disposal plants	Rudolph Schweizer, Jr., Engr.
O.	Columbus	Noon, Feb. 1	Furnishing and erecting motor driven centrifugal pump-ing machine	G. A. Borden, Pres. Bd. Pur.
N. Y.	Rochester	11 a.m., Feb. 2	Furnishing grit excavator for sewage disposal works	F. E. Elwood, City Engineer
Wis.	Milwaukee	2 p.m., Feb. 3	Constructing 3,560 ft. of 60-in. c. l. pipe and reinforced concrete sewer and 1,630 ft. 12 to 24-in. sewer	T. C. Hatton, Ch. Engr. Sew- erage Comm.
O.	Cleveland	Noon, Feb. 3	Constructing sewers in several streets	A. R. Callow, Com. Pur. & Sup.
N. Y.	New York	10.30 a.m., Feb. 3	Constructing two sewers	D. Mathewson, Pres. Boro of Bronx
Wis.	Milwaukee	Feb. 3	Constructing main outfall sewer and two 12-ft. invert- ed syphon sewers under harbor entrance; cost \$441,000	T. C. Hatton, Ch. Engr.
Mo.	St. Louis	Noon, Feb. 4	Constructing sewers at Isolation Hospital	E. R. Kinsey, Pres. Bd. P. S.
Fla.	Dunedin	7.30 p.m., Feb. 4	Constructing 2,800 ft. 6 and 12-in. sanitary sewer and one Imhoff tank	J. N. Drew, Town Engr.
O.	Youngstown	Noon, Feb. 4	Constructing 8,800 ft. 18 to 48-in. vitrified pipe sewer	Harry Parrock, Dir. P. Ser.
M.	St. Louis	Noon, Feb. 4	Constructing 19,680 ft. 6 to 60-in. sewers	W. T. Findley, Secy. Bd. P. S.
N. J.	Millville	3.30 p.m., Feb. 4	Furnishing liquid chlorine sewage disinfecting apparatus with capacity of 1,750,000 gallons per 24 hours	W. F. Ware, Dir. Parks & Pub- lic Property.
O.	Cuyahoga	Noon, Feb. 7	Const. about 4 miles of sanitary sewers and laterals	E. D. Barstow, Village Engr.
Neb.	Wausau	1 p.m., Feb. 7	Const. 19,000 ft. sanitary sewer with appurtenances; con- structing disposal plant	F. E. Anderson, City Clk.
Kan.	Salina	8 p.m., Feb. 7	Const. 8,180 ft. 10 to 18-in. sewer, 14 catch stations and 31 manholes	P. C. Wakenhut, City Engr.
Minn.	Wheaton	1 p.m., Feb. 8	Constructing county ditch, estimated cost \$8,000	J. T. Erickson, Co. Aud.
O.	Shaker Heights	Noon, Feb. 8	Constructing storm and sanitary sewers	C. A. Palmer, First Nat. Bk., Cleveland
Ind.	Washington	2 p.m., Feb. 9	Constructing 34 miles of drainage ditch	W. J. Shanks, Co. Surveyor
Ill.	Chicago	Noon, Feb. 10	Constructing stockyards intercepting sewer	John McGillen, Clerk Sanitary District
D. C.	Washington	2 p.m., Feb. 14	Const. 125 ft. of 2 1/4 x 3-ft. brick and concrete sewer	Chief Clk., Engineer's Dept., District Bldg.
W. Va.	Bath	Noon, Feb. 15	Constructing storm sewers and inlets	C. L. Hunter, Recorder
Ia.	Des Moines	Feb. 15	Constructing sewer system, estimated cost \$209,000	F. Carsa, City Engineer
Minn.	Jackson	10 a.m., Feb. 15	Constructing tile ditch, cost \$58,256	P. D. McKellar, Co. Aud.
Ia.	Des Moines	Feb. 23	Constructing sewer system, estimated cost \$209,500	D. E. Thomas, Asst. Engr.
Mont.	Billings	Mar. 7	Constructing storm water sewer system, cost \$63,000	E. M. Sneckenberger, City Engr.
Minn.	Moorehead	2 p.m., Mar. 9	Constructing and repairing ditches	A. O. Houghum, Co. Aud.
N. J.	Newark	Mar. 14	Constructing 2,700 ft. Passaic Valley trunk sewer	Passaic Val. Sew. Commission
Ia.	Wall Lake	Apr. 1	Straightening and deepening river and draining swamp	Seth Dean, Eng., Glenwood
Mich.	Macon	Apr. 1	Constructing branch of Macon drain	D. S. Sullivan, Co. Drain Comr.
WATER SUPPLY				
D. C.	Washington	Jan. 29	Pipe fittings, valves, cocks and gauges	Gen. Purchasing Officer, Pan- ama Canal
Wis.	Kenosha	Jan. 29	Const. wtr. wks. pump. sta. & purification plant	Board of Water Comrs.
Wis.	Oshkosh	2 p.m., Jan. 31	Constructing filtration plant	Board of Public Works
Wyo.	Thermopolis	Jan. 31	Constructing waterworks	A. J. Lowrey, Town Clerk
Tex.	Temple	Noon, Jan. 31	2 Multi-stage centrifugal pumping units, direct con- nected to motors	J. T. Martin, City Secy.
N. J.	N. Brunswick	10 a.m., Feb. 1	Two steam turbines centrifugal pumps of 5,000,000 gals. capacity each	Asher Atkinson, City Engr.
D. C.	Washington	10 a.m., Feb. 1	Pipe fittings and wrought iron pipe for Navy Department	S. McGowan, Paymaster Gen.
N. J.	New Brunswick	Feb. 1	Constructing reservoir, dam, filtration plant, pump and stand pipe, estimated cost \$150,000	Eugene McLaughlin, Engr.
Wash.	Seattle	Feb. 1	Furnishing electrically-driven pump and accessories	Bu. of Sup. & Accts., Navy Dept., Washington, D. C.
N. Y.	Brooklyn	10 a.m., Feb. 1	Furnishing wrought iron pipe at Navy Yard	Navy Pay Office, N. Y. City
S. C.	Orangeburg	Feb. 1	One or two engine generator exciter units, condenser, motor-driven triplex pump, complete switchboard, 300- ton c-l. pipe, etc.	J. E. Salley, Supt. W. & Lt.
N. Y.	New York	Feb. 1	Furnishing and placing copper lining in portion of city aqueduct tunnel	Bd. of Water Supply
Ind.	Fort Wayne	10 a.m., Feb. 1	Electric deep well tank pump (furnished and installing)	Will Johnson, Co. Aud.
Kans.	Plains	Feb. 3	Constructing water works system, estimated cost \$12,000	City Clerk
O.	Cleveland	Noon, Feb. 3	Excavating trench for water pipe	A. R. Callow, Com. Pur. & Sup.
Fla.	Dunedin	Feb. 4	Constructing 10,600 feet 4 to 8-in. water mains	J. N. Drew, Engr.
O.	Youngstown	noon, Feb. 4	Ripraping pavement at reservoir	Dan Jones, Clk. Pub. Service.
D. C.	Washington	Feb. 5	Hot water piping system in hospital at Portsmouth, N. H.	Bureau of Yards & Docks.
Ill.	Sullivan	Feb. 7	Furnishing material and improving water works and electric light plant	F. C. Newbould, City Clerk.
Australia	Sydney	Feb. 7	Two 4,000-gal. centrifugal pumps with electric motors	Metropolitan Bd. & W. S. & Sewerage, 341 Pitt St.
Ont.	Hamilton	5 p.m., Feb. 7	Sup. mech. rakes, traveling hoist and grab bucket	A. F. McCallum, City Engr.
O.	Shaker Heights	Noon, Feb. 8	Constructing 12-in. water main	C. A. Palmer, First Nat. Bk., Cleveland
Ia.	Arcadia	Feb. 8	Furnishing material and constructing waterworks	L. W. Cox, Eng., Des Moines.
Mich.	Detroit	2.30 p.m., Feb. 8	Furnishing 304 4 to 48-in. gate valves	H. A. Gilmartin, Secy. Water Commissioners.

## BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
New Zealand	Dunedin	Feb. 9	Furn. & erect. mech. filter. & aerat. plant for pub. baths.	Town Clerk
Wis.	Milwaukee	10.30 a.m., Feb. 9	Furn. 99 tapping valves, 333 gate valves, 75 tons of special castings & 1,700 tons 6 to 12-in. c. i. water pipe.	F. G. Simmons, Comr. Pub W.
Ala.	Camden	Feb. 9	Const. 80,000-gal. steel tower & tank, 80,000-gal. reinf. conc. tank, pumps, fire hydrants, pipe, etc., cost \$15,500.	E. B. Kay, Engr., Tuscaloosa
Ill.	Viola	Feb. 14	Constructing waterworks system.	Terhune & Horton, Engrs., Peoria
O.	Farmersville	Feb. 15	Waterworks supplies.	A. F. Gilbert, Vil. Clk.
N. Y.	Lewiston	Feb. 15	Furn. material and const. improvements to waterworks.	A. O. Peabody, Engr.
Wis.	Milwaukee	10.30 a.m., Feb. 16	Furnishing 2,100 curb cocks.	F. G. Simmons, Comr. Pub W.
Ida.	McCammon	Feb. 22	Waterworks construction, including 4,700 ft. 4 to 8-in. pipe, wells, etc., to cost \$22,000.	Cotton & Wilson, Engrs., Idaho Falls
D. C.	Washington	Feb. 23	Bronze and malleable iron castings.	General Purchasing Officer, Panama Canal
Ind.	Bloomington	Feb. 24	Constructing pipe and power line.	Leonard Mill Water Co.
Wash.	Colville	Mar. 1	Const. 3 miles 10 & 12-in. pipe & concrete reservoir & dam; cost, \$20,000.	City Clerk
La.	New Orleans	Noon, Mar. 22	Constructing addition to pumping station.	G. G. Earl, Gen. Supt. Water & Sewer Bd.
Ala.	Cullman	Apr. 1	Laying 2 miles of 6-in. water mains; cost \$12,000.	A. G. Coe, City Clerk.
<b>MISCELLANEOUS</b>				
Pa.	Bethlehem	noon, Jan. 29	Furnishing one 10-ton gasoline road roller and one motor-driven sprinkling and flushing truck.	C. M. Cawley, Boro. Engr.
D. C.	Washington	10.30 a.m., Jan. 29	Electric cable, pipe fittings, valves, etc.	Gen. Pur. Off., Panama Canal
D. C.	Washington	10.30 a.m., Jan. 29	Refrigerating apparatus.	Gen. Purchasing Officer, Panama Canal
La.	LeMars	1.30 p.m., Jan. 29	Furn. cement reinforcing steel and metal culverts.	J. M. Hayes, Co. Auditor
La.	Decorah	1.30 p.m., Feb. 1	Furn. 1,500 bbls. cement and 108,000 lbs. reinforcing steel.	Oscar Winger, Co. Aud.
N. Y.	Albany	noon, Feb. 1	Constructing 6.23 miles barge canal.	W. W. Wotherspoon, Com. P.W.
La.	Garner	1 p.m., Feb. 1	Furnishing 10 to 24-in corrugated iron pipe (23,750 ft.).	E. P. Hanson, Co. Auditor.
N. Y.	New York	10.30 a.m., Feb. 2	Furnishing 10 automobile runabouts.	Robt. Adamson, Fire Comr.
Ill.	Chicago	Noon, Feb. 3	200,000 sq. yds. riprap on slopes of Calumet Sag Channel.	Clerk, Sanitary Dist.
Ind.	Jeffersonville	10 a.m., Feb. 4	Furnishing garbage carts.	Maj. T. B. Hacker, Depot Q. M.
O.	Lakewood	Noon, Feb. 5	Furn. one 3-ton and one 5-ton motor truck and five steel tank garbage wagons; collecting ashes and garbage.	N. T. Cotabish, Dir. Pub. Wks.
Miss.	Vicksburg	Noon, Feb. 7	One .....	J. D. Laughlin, Clk. Bd. Supvs.
Wash.	Ellensburg	10 a.m., Feb. 7	Two 750-gal. power sprinklers.	W. G. Damerow, Co. Aud.
Minn.	St. Paul	10 a.m., Feb. 7	10-ton steam or gasoline road roller.	G. J. Ries, County Auditor.
Mont.	St. Ignatius	Feb. 8	4,000 cu. yds. of excavation, 900 sq. yds. of paving, laying 1,300 ft. vitrified pipe and placing 300 cu. yds. reinforced concrete and 35,000 pounds of steel.	U. S. Reclamation Service.
Que.	Montreal	Feb. 10	Constructing 3 comfort stations.	A. Chausse, Arch., City Hall.
Alaska	Ketchikan	Feb. 10	Materials for constructing St. Elias lighthouse.	Light House Inspector.
N. Y.	New York	Noon, Feb. 10	Constructing subway.	P. Serv. Comm., 154 Nassau St.
Wash.	Seattle	Feb. 15	Furnishing material for 300-ft. span highway bridge in Alaska.	Alaska Road Commission, U. S. Engineer's Office
N. J.	Plainfield	8 p.m., Mar. 6	Furnishing 2,000 tons crushed stone and screenings; also crosswalks and curbing.	J. T. MacMurray, City Clerk.

## STREETS AND ROADS

**Birmingham, Ala.**—Chamber of Commerce at their annual meeting Jan. 13 went on record as favoring issuance of \$1,000,000 of bonds by Jefferson county for construction of good roads, major portion to be used for Warrior river highway. Balance of the money was recommended for use for rebuilding of wornout roads and for construction of additional permanent highways.

**Batesville, Ark.**—City council Jan. 10 ordered property holders in eastern section of Batesville to construct sidewalks and to have them completed within 30 days.

**Douglas, Ariz.**—City contemplates expenditure of \$150,000 for paving; \$20,000 will be used for improving 24-mile road between Douglas and Bisbee.

**Texarkana, Ark.**—An ordinance has been approved authorizing the board of public affairs to advertise for bids and contract for completion of work south of 9th St. in Paving Improvement District No. 21.

**Tucson, Ariz.**—A decision to accept the proposition of Rosecrans Engineering Co. of Chicago to do locating, surveying and blue print work on county roads to be constructed under new bond issue of \$300,000, was made at meeting of board of supervisors held Jan. 14. Question of calling for bids for the bonds was not taken up, but will be considered at later meeting.

**Highland Park, Cal.**—City commission will be petitioned shortly for paving of 24th St.

**Los Angeles, Cal.**—Board has ordered grading to be done on several streets.

**No. Sacramento, Cal.**—Residents of Rio Linda and Elverta have renewed their campaign to have county highway commission route proposed county highway via Del Paso Heights and North Sacramento instead of levee route to Marysville. Petition has been placed in circulation for signatures of all residents interested, and mass meeting will be held in Del Paso Heights soon. Both North Sacramento and Del Paso Heights Improvement Clubs have been asked to endorse movement.

**Sacramento, Cal.**—State highway commission accepted 52.2 miles of new state highway at regular monthly meeting Jan. 11, and also let certain contracts for construction of 16.7 more miles of roadway and construction of bridge over Petaluma Creek, at Green Point, between Sonoma and Marin Counties.

**Sacramento, Cal.**—Commission has passed resolution authorizing paving on V St.

**Sacramento, Cal.**—Plans are being made for construction of highway connecting Sacramento with Vernon at cost of about \$200,000.

**Sacramento, Cal.**—Commission Jan. 11 asked Advisory Board for formal approval of issuance of contract for construction of a unit of a highway lateral between Penryn and Auburn. Contract on other line between Penryn and Roseville will not be awarded until next meeting, as several rights of way matters are yet to be disposed of. The A. C. McLain Construction Company of San Francisco was awarded Penryn-Auburn work, their bid of \$30,814.60 being the lowest. The contract for the construction of Corning-Proberta unit, upon formal approval of the Advisory Board, will be awarded to Taylor and Berliner of Willows, their bid being \$61,282. The Healy-Tibbitts Company of San Francisco will be awarded contract of bridge across Petaluma Creek near Greenpoint. Their bid was \$89,791.

**San Bernardino, Cal.**—Assemblyman Avey of Riverside telegraphed that State Highway Commission has decided to begin at once and rush work on road toward Imperial Valley from San Bernardino, Riverside and Los Angeles counties, in accordance with provisions of Avey bill which was passed by legislature last year, but denied executive approval. Work will begin at southern boundary of Riverside county. In bad places west of the Salton Sea and across the sand hills, permanent work will be done.

**Santa Clara, Cal.**—The \$45,000 bonds voted at special election held on Dec. 23 for purpose of completing highway in

Santa Clara and for the paving of Homestead road, will be sold at an early date as bids for same have been received by town trustees. H. R. Fisher, town engineer, is preparing necessary maps and specifications and it is thought that contracts for actual work will be let within the next 30 days.

**Santa Monica, Cal.**—Announcement that all Topanga canyon driveway is to be macadamized was made to city commissioners Jan. 15 by W. J. Stadelman, former city councilman, who appeared in behalf of Palisades beach road project. He said he had been informed of proposed improvement by Edward Smale, county road superintendent.

**Bridgeport, Conn.**—Council has ordered extension of Elm St. at estimated cost of \$20,000.

**Fellsmere, Fla.**—Commission is discussing plans for paving to be done on several streets.

**Jacksonville, Fla.**—See "Bridges—Contracts Awarded."

**Orlando, Fla.**—See "Miscellaneous."

**Bloomington, Ill.**—Board of local improvements Jan. 11 approved estimate and adopted resolution for a brick pavement on Center St., between Jefferson St. and Seminary Ave.

**Rock Island, Ill.**—Repaving of 20th St. from 7th to 18th Ave., a project which will cost \$35,311, according to city engineer's estimate, was adopted by board of local improvements Jan. 15.

**Springfield, Ill.**—In the county court city has filed a petition for repaving of 4th St. from Monroe St. to Madison St., agreeing to pay 10 per cent. of the total cost of improvement.

**Anderson, Ind.**—Road bonds totaling \$183,020 have been sold to A. L. Kittelman of Muncie for a premium of \$4,245.40.

**Fort Wayne, Ind.**—Petitions for paving of 45 city thoroughfares have been filed with board and many of these streets will be finished this year.

**Fort Wayne, Ind.**—City contemplates expenditure of \$25,000 for road improvement.

**Fort Wayne, Ind.**—See "Sewerage."

**Fort Wayne, Ind.**—Grace Construction Co. is low on the bidding for Rudisill Blvd. improvement with a price of \$34,432 for paving street with Standard Oil mixture or with a Bermudes natural lake pour, similar to pavement on the Yellow River Rd. All bids submitted were below the engineer's estimate and the contract will be let on proposals made yesterday afternoon. The park commissioners spent a portion of this morning checking over figures and insuring that materials are up to requirements of the specifications. The bids above the Grace Co.'s proposal are as follows: McAfee-O'Connor Co.—Aztec brand, \$26,133.25; Stanolin, \$35,589.25; Texaco, \$35,861.26; Atlantic, \$36,405.25; Tarvia B, \$36,132.25. Moellering Construction Co.—Aztec, \$25,825.35; Pioneer, \$36,097.35; Stanolin, \$35,281.35; Texaco, \$35,825.35; Atlantic, \$35,825.35. Richard H. Shaffer—Stanolin, \$35,050.35; Atlantic, \$35,866.05.

**Goshen, Ind.**—Goshen city council has voted to pave two miles of streets during coming summer. In addition, several highway entrances to city will be improved by council and board of county commissioners. Improvements are estimated to cost more than \$100,000.

**Indianapolis, Ind.**—Board of commissioners of Adams County, Ind., will receive bids for construction of a macadamized road in Washington Township in said county known as John Appleman macadam road Feb. 8, 1916, at regular meeting of said board of commissioners, held in city of Decatur, Adams County, Ind. T. H. Baltzell is auditor.

**Indianapolis, Ind.**—Board of commissioners of Adams County, Ind., will receive bids for construction of macadamized road in Union Township in said county known as the A. F. Thelme macadam road, up to Feb. 8, 1916, at regular meeting of said board of commissioners of city of Decatur, Adams County, Ind. T. H. Baltzell is auditor.

**Indianapolis, Ind.**—Board of Commissioners of Adams County, Ind., will receive bids for construction of macadamized road in French Township, in said county, known as the Amstutz-Neuhauser macadam road, Feb. 8, 1916, at regular meeting of board of commissioners, held in city of Decatur, Adams County, Ind. T. H. Baltzell is auditor.

**Indianapolis, Ind.**—Board of Commissioners of Adams County, Ind., will receive bids for construction of macadamized road in Hartford Township, in said county, known as John Pearson macadam road, up to Feb. 8, 1916, at the regular meeting of said board of commissioners in city of Decatur, Adams County, Ind. T. H. Baltzell is auditor.

**Indianapolis, Ind.**—Board of Commissioners of Adams County, Ind., will receive bids for construction of macadamized road in Kirkland Township, in said county road, up to Feb. 8, 1916, at regular meeting of said board of county commissioners held in city of Decatur, Adams County, Ind. T. H. Baltzell is auditor.

**Indianapolis, Ind.**—Board of Commissioners of Adams County, Ind., will receive bids for construction of macadam road in St. Mary's Township, in said county, known as Warren Jones macadam road, up to Feb. 8, 1916, at regular meeting of said board of commissioners, held in city of Decatur, Adams County, Ind. T. H. Baltzell is auditor.

**Indianapolis, Ind.**—Board of Commissioners of Adams County, Ind., will receive bids for construction of macadam road in Wabash Township, in said county, known as the Robert Speicher macadam road, Feb. 8, 1916, at regular meeting of said board of commissioners held at Decatur, Adams County, Ind. T. H. Baltzell is auditor.

**Indianapolis, Ind.**—Board of Commissioners of Adams County, Ind., will receive bids for construction of macadam road in Blue Creek Township, known as Elmer Ely macadam road, up to Feb. 4, 1916, at regular meeting of said board of commissioners, in city of Decatur, Adams County, Ind. T. H. Baltzell is auditor.

**Lebanon, Ind.**—City Engineer Walter Whitecotton submitted estimate of cost of construction of proposed improvement of West Washington St., showing the cost of highest priced pavement to be \$12,757.

**Noblesville, Ind.**—Seven sets of gravel road bonds, aggregating \$109,320, were sold by county treasurer to the Citizens' State Bank of this city at par, accrued interest and a premium of \$1,135.

**Richmond, Ind.**—Petition for cement curbs and gutters on South Ninth St., between E and H Sts., macadamizing of the roadway, signed by 17 property own-

ers, was submitted to council Jan. 17. This was referred to board.

**Richmond, Ind.**—Board of public works Jan. 17 approved resolution for paving of No. 5th St., from A St. to D St., and a resolution for paving of Fort Wayne Ave., from Main St. to D St. Board approved resolution for concreting of alley between No. 10th and 11th Sts. from Sailor St. to No. A St.

**South Bend, Ind.**—Petition has been received by board of public works for paving of South St. Louis St. from Jefferson Blvd. to Division St. It is being considered.

**Creston, Ia.**—Resolution has been introduced by city council providing for construction of about 100,000 yds. of street paving and 75,000 ft. of curbing. Various types of pavement are under consideration. Further action will be taken Feb. 7. Carl Davenport is City Clerk and Theo S. DeLay, City Engineer.

**Muscataine, Ia.**—Recommendation will be submitted to council by City Engineer Young to effect that city try out a plan of resurfacing old brick paved streets with asphalt. It is probable that block of Sycamore St. between Second and Third Sts. will be used for experiment, and if it proves satisfactory upon completion 16 miles of brick paved city streets will be treated in like manner.

**Nevada, Ia.**—Following decision of the Jefferson Highway commission to make Nevada meeting place of the Jefferson & Lincoln highway, county supervisors are making plans for street and road improvements. They will eliminate dangerous grade crossing at Indian, and will straighten road to Colo and city will pave Lincoln highway through the city.

**Red Oak, Ia.**—Bond issue of \$70,000 bridge and road bonds were sold Jan. 13 to George M. Bechtel & Co., of Davenport, Ia., who offered premium of \$955 for the bonds.

**Sioux City, Ia.**—Members of Heights Association at annual meeting Jan. 10 at Commercial Club decided to petition city council to pave streets in that addition, and it was stated by members petition would be filed with city clerk shortly.

**Vinton, Ia.**—During 1916 Rockwell City is to have two miles of new paving and an addition to sewerage system to cost \$35,000.

**Hutchinson, Kans.**—City commissioners Jan. 14 gave approval to plans of City Engineer G. L. McLane for the paving on 4th Ave. East, and bids will be advertised for shortly.

**Hutchinson, Kans.**—Contract for construction of 4th St. paving will be awarded Jan. 25.

**Benham, Ky.**—Movement is on foot for building of a fine roadway from Benham, in upper Harlan county, up Clover Lick creek and through Loonly Creek section of Wise county, Virginia, to Roda, in Virginia coal fields, a distance of twenty miles. Wise county will build half road, while other half, Kentucky end, will be built with aid of road bonds, as Harlan has called an election for Feb. 12 for voting bonds to amount of \$200,000. The same or an equal amount will be appropriated by state good roads department.

**Georgetown, Ky.**—Scott county has voted in favor of \$100,000 road bond issue.

**Hopkinsville, Ky.**—Petitions were lodged for record Jan. 17 in office of county judge calling for an election on Mar. 18 to submit to voters of Christian county question authorizing a \$400,000 bond issue for improvement and development of roads of county.

**Whitesburg, Ky.**—County Judge Henry T. Day and members of Letcher Fiscal Court are making plans for calling of an election for voting bond issue to the amount of about \$150,000 for purpose of further prosecuting work of building good roads in this county. Election, according to Judge Day, is planned for some time toward latter part of March. It is believed issue will carry largely.

**Billerica, Mass.**—Following appropriations will be discussed at next meeting of voters. Appropriate sum of \$2,500 to extend macadam road on Boston road from northerly end of present macadam, providing county and state shall each furnish similar amount. Appropriate sum of \$2,250 to complete macadam road on Concord road, or do anything in relation thereto. Appropriate \$500 for extension of sidewalk on Main St. to Bennett hall station, or do anything in relation thereto. Appropriate sum of \$500 to straighten and gravel High St. from Robers St. to Mt. Pleasant St. Appropri-

ate sum of \$800 for repairs on Pine St. Appropriate \$2,000 to purchase an automobile fire truck for fire department. Authorize selectmen to lay out six new streets. Instruct water commissioners to connect its water mains on High St. To appropriate \$682.50 to install 35 street lights along Boston road from Tufts lane to the Billerica-Burlington line.

**Canton, Mass.**—An issue of \$100,000 of road improvement bonds has just been ordered in beat two of Madison County, and highway commissioners have been appointed. Total of \$330,000 is to be spent on county's roads.

**Gloucester, Mass.**—A bill to provide for laying out and construction of highway between town of Rockport and city of Gloucester was filed Jan. 14 by Representative Harry C. Foster of Gloucester in office of clerk of the State House, Boston.

**Lenoxdale, Mass.**—Petition is being circulated asking for appropriation of \$5,000 with which to continue state road which Lee has built to Lenox line, to Lenox station.

**Lowell, Mass.**—Highway and county commissioners held a conference relative to exact amount of co-operation with Lowell in reconstruction of First St. and it was decided that state will do the work of building roadway from Read St. to Dracut line through Indian Orchard, cost of the early stages of work to be paid by city. The cost will figure out about \$38,000 for the city, \$30,000 for the state and about \$12,000 for the county. On next Wednesday, Jan. 26, hearing will be given at state house on bill providing for completion of missing link in Lowell-to-the-sea boulevard, there being a 2-mile stretch of this road to be completed, one mile in Lawrence and the other in Methuen.

**Milford, Mass.**—Among recommendations to be made to town by selectmen are purchase of road roller. Board declares itself of opinion that several bridges in various sections of town are unsafe and there is a recommendation favoring reconstruction of concrete and that an appropriation be made for the purpose. The board also recommends that West St. between Congress and High Sts. be rebuilt and that there be an appropriation for this purpose. Board also recommends appropriations for resurfacing several sidewalks, which are at present in poor condition.

**Newton, Mass.**—Boulevard from Maple St. to Jefferson St., Newton, to connect with Brooks St., Brighton, was advocated at hearing held by the committee on metropolitan affairs Jan. 19. Elias B. Bishop, city solicitor, said that boulevard would offer a straight road between metropolitan park system and Watertown and would relieve traffic congestion. Committee postponed until Jan. 31 hearing on report to admit Reading to the north metropolitan sewerage district. It also postponed until Feb. 4 the hearing on bill to improve Ocean Ave. boulevard in Revere.

**Sault Ste. Marie, Mich.**—The successful bidders were W. B. Hutchinson, Michigan City, Ind.; M. J. Bocco, Iron Mountain, and D. F. Boyle & Co., Crystal Falls. Mr. Hutchinson was only bidder on Gatesville-Stalwart road, being slightly over ten miles in length. Bids were received on this piece of road as follows: Class E, limestone, \$66,000; Class C, stone and gravel, \$54,000; Class B, all gravel, \$42,000. Committee was of the opinion that this road should be constructed of Class C, stone and gravel, at price of \$54,000, and made this recommendation. Bid has a condition attached that this bid is based upon the acceptance of state highway department of material found within one mile of the road. M. J. Boco was lowest bidder on Brimley road, a distance of eight and a half miles. His bid was \$63,243.69 for a limestone bottom and trap rock top. Following bids were made on this road: Limestone—M. J. Bocco, Iron Mountain, \$54,272.26; W. B. Hutchinson, Michigan City, \$54,500; Smith, Byers & Sparks, Houghton, \$75,551.62. Limestone with trap rock top—M. J. Bocco, \$63,243.69; W. B. Hutchinson, \$65,000; Smith, Byers & Sparks, \$80,384. All trap rock—Smith, Byers & Sparks, \$57,227.40. Bid of D. F. Doyle & Co., which was \$45,725.58 for a limestone-trap rock construction on Rudyard road, which covers distance of approximately six and one-quarter miles, while other bids covered a distance of about five and one-quarter miles. Reason for this is accounted for by fact that state highway department did not furnish plans for additional road until this week and were accepted by Boyle & Co. Difference, however, between bids

is so great that committee recommended that board of supervisors recommend that board of county road commissioners enter into contract with Boyle & Co. at \$45,725.58. This bid covers construction of culverts and all concrete work, making road complete and ready for travel, while other bidders excluded from their bid construction of said culverts and concrete work. Bids received for the construction of this road were as follows: Limestone—D. F. Boyle & Co., Crystal Falls, Mich., \$39,129.20; W. B. Hutchinson, Michigan City, Ind., \$48,000; M. J. Bocco, Iron Mountain, Mich., \$52,152.24. Limestone, trap rock top—D. F. Boyle & Co., \$45,725.58; W. B. Hutchinson, \$58,000; M. J. Bocco, \$60,422.24. All trap rock—D. F. Boyle & Co., \$51,738.20. Only bidder on the 7.5 miles on the Pickford road was W. B. Hutchinson and he proposed to build road of limestone for the sum of \$55,000, or limestone bottom and trap rock top for \$66,000. He also made a proposition to construct northerly portion between stations 160 and 349 on state plans, being a distance of approximately three and one-half miles, with limestone for \$25,000 or limestone bottom and trap rock top for \$30,600. He also proposed to build between stations 349 and 560, a distance of approximately four miles, with class C material, being crushed stone bottom with gravel top for the sum of \$21,500. As road between stations 160 and 349 is in good passable condition, committee recommended that board of supervisors recommend to board of county road commissioners, that it enter into contract with W. B. Hutchinson to construct that portion of road lying between 349 and 560 of class C material, for sum of \$21,500.

**Duluth, Minn.**—Seven bids for paving West 1st St. between 20th and 30th Aves. West, were opened Jan. 14 by Secretary F. E. Culver, of public works division, for jobs that will cost approximately \$60,000.

**Duluth, Minn.**—Resolutions ordering paving of Fifth Ave. West from Superior St. to point 140 ft. north of north line of W. 1st St. and 19th Ave. East, from 4th St. to 8th St., were prepared Jan. 13 by Secretary F. E. Culver, of public works division.

**Duluth, Minn.**—Council has approved resolution that Central Ave., from Cody St. to Columbia St. be paved and otherwise improved with a 30 ft. roadway from Cody St. to 6th St., and a 24-ft. roadway from 6th St. to Columbia St. That sewer, water and gas connections be laid from the mains to the curbs, where not already done; that provision be made for the drainage of surface water, and that all work be done which is necessary or incident to said improvement. Estimated cost of said improvement, as previously estimated by the city engineer, is as follows: \$45,277.43 for brick; \$45,499.85 for creosote blocks; \$35,296.91 for bituminous concrete; \$32,630.51 for concrete; \$51,053.75 for sandstone; \$39,296.51 for bitulithic.

**Duluth, Minn.**—Following bids were received Jan. 21 for asphalt pavement on Superior St. from 16th to 23d Ave. E.: General Constr. Co., Minneapolis, at \$44,650.30; D. H. Clough & Co., Duluth, at \$46,646.95; E. A. Dahl Co., Duluth, at \$47,559.

**Duluth, Minn.**—City will have to pay just about twice as much for its road oil this year as it did a year ago. Only one bid was entered on furnishing city with road oil and when opened Jan. 18 showed an increase of 100 per cent. over a year ago. Standard Oil Co., which received contract last winter, on its bid of 2 cts. and a fraction per gallon, this year asks 5.21 cts. a gallon. As city requires about 200,000 gallons for use on streets and boulevards next summer, the oil will cost \$10,420, according to estimate. Commissioner Farrell has not decided whether or not he will accept bid.

**Minneapolis, Minn.**—Council committees, park board and county commissioners adopted plans Jan. 18 to spend \$1,500,000 during 1916 on Minneapolis and Hennepin county highways. City council paving committee decided that \$1,090,000 should be spent by the city in carrying out most comprehensive paving program Minneapolis has ever had. The ways and means committee of the council voted to sell \$600,000 worth of bonds immediately to start on this work. Balance of budget will be provided later. Paving program for Minneapolis boulevards was favorably passed upon by park board improvement committee. Park Supt. Theodore Wirth was instructed to prepare plans for improvement of Minnehaha parkway. The report of the county surveyor, made yesterday, provided a program of oiling and grading Hennepin

county roads which is aimed to put them in best of condition. County and park board improvements will cost nearly \$500,000.

**Edwards, Miss.**—Election will be held Jan. 27 to authorize bond issue of \$30,000 for good roads.

**Laurel, Miss.**—City commissioners of Laurel propose to issue bonds in sum of \$25,000 to raise funds to defray city's share of additional street paving, to extend sewer mains in districts where additional paving is to be laid, and to erect new two-room school building in Wausau Addition.

**Chillicothe, Mo.**—Council has ordered improvement of 11 streets by grading, curbing and paving.

**St. Joseph, Mo.**—Ordinances have been passed providing for grading on alley between Duncan St. and Doniphan Ave., Edmond St. from 19th to 20th Sts., alley between Jules and Francis Sts.

**Lodi, N. J.**—County Supervisor of Roads Harrop appeared before Lodi borough council Jan. 17 with a plan of proposed new county road which he would be pleased to have the local authorities take into consideration as new board of freeholders will have survey made of Lodi in regard to establishing a county road from Garfield bridge to Terrace Ave. New road, as outlined by Mr. Harrop, will run from Main and Union Sts. through private property of United Piece Dye Works and other private property between Mercer and Main Sts. and extend as far as bridge at Passaic Ave. and is laid out at a width of 60 ft. Council has taken matter under advisement and will appoint committee to work in conjunction with Mr. Harrop to wait on officials of the U. P. D. W. and other property owners interested in order to get their consent.

**Newark, N. J.**—City Controller Tyler Farml Jan. 17 sold \$250,000 temporary paving bonds to Salomon Bros. & Hutzler of New York.

**Nutley, N. J.**—With Mayor Abram T. Blum dissenting, town commission Jan. 17 voted to reject all bids for concrete work in town during coming year. Bids, three in number, were received by commission and opened Dec. 13. According to figures submitted, Samuel Clardi was low bidder, P. & P. Jannarone second and Frederick Spatz, third. The latter had contract for cement work during 1915. Whether new bids will be asked for has not yet been decided. According to a statement made by Clardi this morning a request will be made at next meeting of commission for an explanation.

**Passaic, N. J.**—Delegation of Passaic residents, owning property along Van Houten Ave., appeared before board of freeholders at meeting held Jan. 19, to present petition for improvement of that thoroughfare from River to Clifton Ave. Petition was referred to road committee.

**Perth Amboy, N. J.**—Street committee has practically reached decision to repave city's principal street intersection at Smith St., State St. and New Brunswick Ave. It has also practically decided that proposed garden plots for High St. should not extend further south than Woodruff Place. Regarding the latter project, Chairman Wilson stated that revision plan for High St. pavement was before aldermen Jan. 14. High St. is narrower south of Woodruff Pl. than it is north of that thoroughfare. Whether there are to be garden plots or the street shall be paved from gutter to gutter will be up to property owners between City Hall Park and Woodruff Pl. Because principal street intersection is often slippery and dangerous for pedestrians and horses, aldermen are considering repaving of intersection with either granite or Metropolitan block.

**Albany, N. Y.**—In Monroe county during coming season the State Department of Highways will expend \$152,917 on good road work. The plans in the office of the State Highway Department show that there will be 300.93 miles of good roads in Monroe under maintenance this year, all of which will be kept in shape by department. It was stated Jan. 15 at the office of department that reconstruction of 5.96 miles of road is contemplated in Monroe at a total expense of \$38,286. Roads on which the reconstruction work is to be done are Ridge road in a section just west of Rochester, Lyell Ave. road near the city line, Buffalo road just west of the city, Webster road through the village of Webster and East Henrietta road. Department also contemplates improving 91.88 miles of road in Monroe. Improvement will consist of covering surface with a bituminous ma-

terial and crushed stone, commonly known as tarring and oiling. Expense of this work is estimated at \$27,181. Balance of the appropriation for Monroe will be used in defraying expenses of minor repairs such as filling in ruts, compensation to patrolmen and for materials to be used. In Genesee county department will expend \$15,628 and will reconstruct one mile of the Batavia-East Pembroke road. Expense of the latter will be \$3,445. Total mileage of good roads to be maintained during coming season in county is 48.59. In Orleans county there will be an expenditure of \$26,151, according to estimates. Two miles of road leading south from Albion to Barre will be reconstructed. Total of 91.65 miles of road will be maintained during season. In Chautauque department will expend \$15,390 and will maintain a total of 73.78 miles.

**Cannoharie, N. Y.**—Board is discussing question of good roads.

**Johnson City, N. Y.**—City will sell \$30,000 bond issue for paving purposes—\$2,200 of this amount will be spent on Grand Ave. and \$8,000 on improvements to Arch St.

**Lestershire, N. Y.**—Bids will be received Feb. 21st for \$11,000 bond issue for paving on Grand Ave., and \$4,000 bond issue for paving on Arch St.

**Lowville, N. Y.**—Meeting was held Jan. 14 to discuss plans for road improvements.

**Syracuse, N. Y.**—Plans have been prepared in state highway department for expenditure of more than \$325,000 in Onondaga County in construction and maintenance of roads the coming season. Of this amount \$245,000 will be expended in the maintenance division under supervision of Second Deputy Commissioner Frederick W. Sarr, of Syracuse. It is calculated to reconstruct or resurface about 18 miles of highways and to give surface treatment of oil and broken stone to 58 miles. Largest new construction will be on state route from old east city line in Syracuse to west village line of Fayetteville, built at state cost. Plans for this road have been prepared at offices of Division Engineer William M. Atcheson in Syracuse and approved by County Highway Superintendent Frank E. Bogardus. They have been delivered to department here for final checking up. Plans for three other resurfacing contracts have been prepared under direction of Mr. Sarr. One of these is Collamer Rd., starting about mile east of Merrick brickyard and running to Schepps Corners, a distance of more than 7 miles. On Syracuse-Watertown state route state will resurface concrete road from Cicero to Brewerton, a distance of 4.84 miles.

**High Point, N. C.**—Election will be held Mar. 7 to vote on bond issue of \$50,000 for street improvement.

**Alliance, O.**—At adjourned session of city council Jan. 10 a number of important matters were considered and initial action taken along several lines. A petition presented by Max Geiger and signed by large list of property owners asked that South Arch Ave. be paved from Mill to Milton Sts. The communication was referred to street and alley committee.

**Alliance, O.**—Ordinance has been passed for improvement of North Freedom Ave. from Wayne St. to Walnut St. by grading, draining, curbing and paving with brick block. Chas. O. Silver is clerk.

**East Youngstown, O.**—Plans are being discussed for widening and straightening of streets.

**Lima, O.**—Petitions for two improved roads are being circulated in county and will be filed with county commissioners shortly. One asks state aid in improving of two miles of the Marion road, running east from county fair grounds, and the other asks that Allentown road be improved with brick instead of concrete, as provided in contract let to Henry Enck last fall. Bid submitted by Enck called for use of stone sand and contract was awarded him with understanding that stone sand be used. When Walter Toy, present county surveyor, took office he objected to use of stone sand and insisted that washed lake sand be substituted. Enck objected on grounds that he had bid on stone sand and had been awarded a contract to use that material. Toy sent samples of the stone sand to state highway department for testing. The result of tests were such that state condemned the use of local sand. Enck agreed to surrender his contract to commissioners if petitions for a brick paving were filed.

**Middletown, O.**—City Commission has

adopted resolutions for paving on Arlington, Linden and Edgewood Aves.

**Newark, O.**—Sealed proposals will be received at office of Auditor of City of Newark, State of Ohio, until 12 o'clock, noon, of Friday, Feb. 18, for the purchase of bonds of the said City in the aggregate sum of \$73,300. \$59,600 will be used for paving of streets and remaining \$13,700 for sewerage purposes.

**Toledo, O.**—The Monroe county, Mich., road commissioners have sent out invitations for bids on Monroe-Toledo highway. Estimated cost of the road is \$155,560. Bids will be closed Jan. 27.

**Bennington, Okla.**—Township No. 9, in Bryan County, voted almost unanimously for issuance of \$25,000 worth of bonds for improvement of public roads in township.

**Dallas, Ore.**—Two issues of 1915 street improvement bonds of city bearing 6 per cent. interest, were offered for sale by city council Jan. 10. Bonds aggregated \$12,665.20. Bids received were: Guardian Trust Co., Denver, \$29.80 premium; Western Bond & Mortgage Co., Portland, \$129 premium; Wilfred Shore & Co., Portland, \$193.77 premium; Spokane & Eastern Trust Co., Spokane, \$67 premium; Dallas City bank, par; Keeler Bros., Denver, \$75 premium; Carson & Earles, Seattle, \$73 premium; Lumbermens Trust Co., Portland, \$135 premium. Award was postponed to later date.

**Portland, Ore.**—Low bid submitted to council for paving Bybee St. from E. 22nd to 466 ft. east of S. P. right of way, was that of Oregon Ind. Paving Co., bitulithic, \$8,227.

**Salem, Ore.**—In annual report submitted to highway commission Jan. 17, State Highway Engineer Cantine suggests that commission give consideration to an Oregon beach highway. At conference held recently with members of county courts in counties interested it was decided that county courts should select representatives who, with highway engineer, should go over proposed route for such highway from Astoria to Crescent City, Cal., he said, and trip probably will be made in July.

**Chester, Pa.**—Ordinance was introduced in council Jan. 17 providing for paving in Butler St.

**Reading, Pa.**—Following a sharp letter from District Attorney Rothermel relative to dangerous condition of the borough's main highway, West Reading Borough Council met Jan. 14 and decided to submit to people a proposition for a bonded loan of \$35,000 to make needed improvements. A special election will be held for purpose.

**Providence, R. I.**—Annual report of state board of public roads, presented Jan. 13 to General Assembly, asks for an appropriation of \$495,000 in addition to \$200,000 automobile fund, and declares that state highway system demands immediate care to prevent it from going into an absolutely irremediable condition.

**Florence, S. C.**—At meeting of city council held Jan. 19 it is announced contracts for 2½ miles of concrete sidewalks and 4,000 sq. yds. of street or roadway paving were awarded. Sidewalks are to be laid at such places and on such streets as council shall later decide.

**Greenville, S. C.**—Although it will be several weeks before county will receive money for \$400,000 in bonds sold to improve public roads, work is being pushed vigorously. It has not been decided what material will be used in construction of roads, but foundation work is being carried on as rapidly as possible.

**Bartlett, Tex.**—Town voted Jan. 17 bond issue of \$24,000 for paving on main business street.

**Beaumont, Tex.**—Order was passed Jan. 11 instructing Auditor Barry to advertise for bids on road work or fill in connection with bridge to be built. There will be about 5,300 cu. yds. of earth used in this fill.

**Belton, Tex.**—Commissioners' court Jan. 14 ordered good roads election for Salado district. Election will be held Saturday, Feb. 19. Amount of bond issue is \$8,000.

**Big Lake, Reagan Co., Tex.**—Jan. 13 county commissioners appropriated \$2,000 for building good road between Big Lake and Stiles. Work will be started immediately and a more practical route will be used than old one.

**Dallas, Tex.**—City Commissioner Lang plans to widen many street intersections.

**Dallas, Tex.**—Bids on grading of Zang's boulevard, between Dallas-Oak Cliff viaduct and Bishop Ave. were called for Jan. 12 by Board of City Commissioners, preparatory to paving street. Board also approved specifications for paving Bishop, between Zang's and Sixth.

**Rogers, Tex.**—Upon petition signed by 168 of citizens of Rogers road district, commissioners' court to-day selected Tarvia as method of finishing highways within city of Rogers, which are to connect improved roads of district. Contract was let to Finley Co., of San Antonio, price being made on unit basis.

**Tyler, Tex.**—City has voted \$100,000 bond issue to finish uncompleted road.

**Salt Lake City, Utah.**—At meeting of state board of examiners held Jan. 17 at capitol a committee of contractors, including Patrick Moran and Joseph W. Mellen, asked board to contribute \$5,000 as its share of a fund of \$30,000 for construction of boulevard past the capitol by way of West Canyon boulevard to Fort Douglas. The plan as outlined to board of examiners is for city to appropriate \$5,000 and county and state each \$5,000 leaving \$15,000 to be raised by popular subscription. Board of examiners explained that while it would make no cash appropriation, it would gladly furnish earth available from its excavations as soon as grade was established and could properly and advantageously be distributed.

**Fairfax, Va.**—Announcement is made by Mitchell Harrison, president of Warrenton and Fairfax Turnpike Co., Inc., that Virginia legislature has passed bill authorizing that company to establish modern highway, suitable for motors, linking up present macadamized roads at Fairfax Court House with same class of road that is being constructed in Fauquier county.

**Norfolk, Va.**—Thirty teachers and 1,248 pupils of John T. West public school, through Principal Jacox, have petitioned board of control for improvements to streets leading to school building. Board informed petitioners that matter was one for council and suggested that it be taken up with members from that ward.

**Norfolk, Va.**—Engineer T. B. Dornin, of water department, has been asked by council to supply estimates of cost of overhauling or putting down new water pipes, etc. on 17th St. which city contemplates improving as follows: 1—Paving Colley Ave. from Armistead Bridge Rd. to Jamestown Ave. Sheet asphalt. 2—Paving St. Julian Ave. in north Brambleton section. Granite block. 3—Paving Church St. from Queen St. north to its intersection with Granby. Wood block. 4—Paving Boush St. from Main St. to Brook Ave. Sheet asphalt. 5—Paving Loyall's lane south of Main St. Wood block or other material requiring concrete foundation. 6—Redgate Ave. 250 ft. east of Matoaka St. and Matoaka St. from Redgate to Raleigh Aves. Sheet asphalt. 7—Paving Wolfe St. from Monticello Ave. to Granby St. Wood block or asphalt paving. 8—Maury Pl. from Colley Ave. to West Ghent Blvd. Sheet asphalt. 9—Balson La. and New Bedford St. Granolithic pavement. 10—Yarmouth St. to bridge. Sheet asphalt. 11—Plume St. from Boush St. to Church St. Wood block or sheet asphalt. 12—Scott St. from Granby St. to Monticello Ave. Granite block. 13—Smooth pavement with concrete foundation on Monticello Ave. from City Hall to Bute St. 14—Pembroke Ave. from Colley Ave. to Dundaff St. Sheet asphalt. 15—Claremont St. from Westover Ave. to Graydon Ave. 16—Hamlin Ave. in Brambleton. Sheet asphalt. 17—Corprew Ave. from Maltby Ave. to Park Ave.

**Norfolk, Va.**—See "Water Supply."

**Norfolk, Va.**—The supervisors figure that they will have about \$9,000 for permanent road building and extension of bridges.

**Portsmouth, Va.**—Committee will ask under what terms city can enter into a contract with Virginia Railway & Power Co. relative to latter furnishing Portsmouth with motor street sprinkler for thoroughfares over which cars run. Sprinkler sought by committee is similar to those used by traction company in Norfolk.

**Kingwood, W. Va.**—Election will be held Jan. 26 to vote on \$164,000 bond issue for good roads.

**Wheeling, W. Va.**—Jefferson County Commissioners in session here Jan. 15 voted for a bond issue of \$24,000 for construction of Ohio River Market Road, which is to be built entire length of county from Belmont to Columbiana County.

**Wellsburg, W. Va.**—At a meeting of Brooke county court held Jan. 18 the county commissioners decided to put the question of bond issue for good roads up to people of county. Total amount of the issue to be asked for is \$300,000, to be spent in a specified way over specified roads in county.

**Ellensburg, Wash.**—At meeting of the state highway board Jan. 14 plans were approved and State Highway Commissioner W. R. Roy was authorized to call for bids for construction of 10 miles of the Sunset highway running from Ellensburg to Vantage on the Columbia River. Legislature appropriated \$29,475 for this stretch of road, which will be first piece constructed of new Ellensburg-Wenatchee road by way of Columbia River. The bids for this piece of work will be opened in about a month and active work started immediately.

**Everett, Wash.**—At first meeting with county commissioners advisory committee of nine business men representing all parts of county recommended expenditure of \$748,050 for road improvement during the year 1916 and the disposal of bonds amounting to \$750,000 to finance work. That amount will pave 45 miles of roadway, regrade 42 miles to allow the road to settle preparatory to surfacing next year and construct two miles of new road. The work proposed by board and agreed to by commissioners includes: Paving from Everett south on the Pacific highway to the King county line, 17 miles; cost, \$193,750. Paving from Cavalero's corner through Snohomish to Monroe, 12.8 miles; cost, \$163,000. From Everett to Cavalero corner present surface will be repaired at an expense of \$4,000. Paving from the Corners to Marysville and north on Pacific highway 3 miles, 10.3 miles in all; cost, \$131,950. Paving part of Edmonds road to the North Trunk highway, 3.5 miles; cost, \$11,000. Paving Main St., Sultan; cost, \$13,750. Regrading road from Snohomish to Machias, 5 miles; cost, \$20,000. Regrading from Hartford to Granite Falls, 7 miles; cost, \$8,004. Regrading from Monroe to King county line, 6 miles; cost, \$8,000. Regrading from Sultan to Gold Bar, 5.8 miles; cost, \$8,000. Regrading 8 miles of Everett-Arlington road; cost, \$32,000. Regrading from East Stanwood to Cedarhome, 2 miles; cost, \$8,000. Paving Main St., Granite Falls; cost, \$12,500. Regrading East Stanwood to Florence, 2.5 miles; cost, \$6,500. Regrading from Arlington to Cooper's spur, 3 miles; cost, \$9,000. Paving from Stanwood north to county line, 2.6 miles; cost, \$33,800. Paving Arlington Main St., .5 mile; cost, \$6,500. Building part of road from Edmonds north; cost, \$13,000. Regrade from Monroe to Sultan, 7 miles; cost, \$17,500. Regrade Snohomish road to Three Lakes, 3 miles; cost, \$6,000. Regrade from Arlington to Silvana, 5 miles; cost, \$13,000.

**Seattle, Wash.**—New national highway extending from Seattle to Savannah, with total mileage of 3,522.4, is being pushed by commercial clubs of cities which proposed road would link. Organization formed to promote highway is confident route will be established by spring.

**Tacoma, Wash.**—Specifications for paving of 2¼ miles of Pacific highway south of Dupont were submitted by county commissioners yesterday to state highway commissioner preparatory to calling for bids. All usual types of pavements are included in specifications, concrete base being provided for even in case of bitulithic.

**Milwaukee, Wis.**—See "Sewerage."

**Sheboygan, Wis.**—A resolution has been adopted authorizing clerk to advertise for bids for sale of \$27,343 pavings bonds and \$4,096.86 sewer bonds.

#### CONTRACTS AWARDED.

**Bakersfield, Cal.**—For grading, paving and constructing culverts on 6.7 miles of road between Maricopa and Taft, to Mackie & McLean, Waseo and San Francisco, at \$29,412.

**Los Angeles, Cal.**—To California-Arizona Construction Co., at following prices: 14.3 cts. per sq. ft. for Warrenite paving; 2 cts. per sq. ft. for grading to sub-grade; 33 cts. per lin. ft. for cement curb, Class A; 42 cts. per sq. ft. for granite block gutter; \$136 for house connection sewers, complete.

**Los Angeles, Cal.**—To Fairchild-Gilmore-Wilton Co. for improvement of Pasadena Ave. at following bid: 16 cents per sq. ft. for asphalt paving; 16 cents per sq. ft. for asphalt repaving; 2 cents per sq. ft. for grading to sub-grade; 30 cents per lin. ft. for cement curb; 12 cents per sq. ft. for cement sidewalk; 30 cents per lin. ft. for concrete wall; \$300 for catch-basins and connecting drain, complete; 10 cents per sq. ft. for resurfacing with broken stone and asphaltic cement binder course and with asphalt wearing surface.

**Los Angeles, Cal.**—By County Board of Supervisors for constructing about five miles of county road in Mint Canyon, to Peter L. Ferry, Glendale, at 25 cts. per cu. yd. for 36,000 cu. yd. excav., 29 cts. per sq. yd. for 58,667 sq. yd. concrete pavement, etc.: total \$29,540. Next three lowest bids: Fred. Hoffman, \$30,603; Leigh G. Garnsey, \$31,984, and E. J. Hein, \$32,089. County furnished cement, sand, rock and oil.

**Los Angeles, Cal.**—For improving Ave. Sixty-four, about 56,400 sq. ft. asphalt paving, to Ford & Stout, Bradbury Bldg., at 13.8 cts. per sq. ft.; total \$11,082. For asphalt paving on Shearer St., about 138,243 sq. ft., to George H. Oswald, O. T. Johnson Bldg., at 12.5 cts. per sq. ft.; total \$22,493. Other bidders: George R. Curtis, \$23,300; Ford & Stout, \$23,450; and Fairchild-Gilmore-Wilton Co., \$23,848. For concrete paving on Westmoreland Ave. to Walter Overell, at \$11,537.

**Sacramento, Cal.**—State board of control Jan. 13 approved award of \$76,457 for purchase of 33 motor trucks for maintenance of state highways under direction of California highway commission. The awards are as follows: Six 5-ton trucks; 2 Moore, \$4,500 each; 2 Sauer, \$4,325 each; 2 White, \$4,710 each; total \$27,070. Fifteen 2-ton trucks; 2 Hewitt-Ludlow, \$1,950 each; 2 Federal, \$2,096 each; 3 Kelly-Springfield, \$2,535 each; 4 Garford, \$2,250 each; 4 Moreland, \$2,250 each; total \$33,697. Twelve 1-ton trucks; 3 Buicks, \$1,290 each; 3 Reo, \$1,112 each; 3 G. M. C., \$1,375 each; 3 Moreland, \$1,443 each; total \$15,693.

**Santa Barbara, Cal.**—For paving Santa Maria Guadalupe road to J. T. Vornwell, Santa Barbara, at \$9,490, county furnishing rock and oil.

**Rensselaer, Ind.**—To Farman Thompson for removing 6,510 cu. yds. earth.

**Ames, Ia.**—To Des Moines Asphalt Paving Co., Des Moines, Ia., for 122,000 sq. yds. bitulithic pavement on 5-in. concrete foundation, 130,888 cu. yds. excavation, at \$1.89½ per sq. yd. for paving & 34 cts. per cu. yd. for excavation. Total bid, \$235,639.92. To Akin & Flutter, Ames, Ia., for curb and gutter at 4½ cts.; total \$32,607.82. J. Q. Wickham is City Engineer.

**Iowa Falls, Ia.**—One of big paving contracts of year in Iowa has just been let here, aggregating for paving, curb, gutter, etc., \$104,442. Ten bidders from various parts of middle-west sought contract, which was awarded Ford Paving Co., of Cedar Rapids. The contract includes 51,000 yds. of asphaltic concrete paving, besides the paving of several alleys with concrete and the usual curb and gutter abutting the paving. The lowest bid for this kind of paving was made by the White Contracting Co., of Milwaukee, which filed a bid of \$1.61 a yd. The Ford bid for paving was one cent higher, but Ford Co. offered a lower price on balance of contract. Work on job will commence as soon as weather will permit this spring.

**Newark, N. J.**—To Charles S. Carosino for grading, curbing and laying sidewalks in Hillside Ave., at \$6,580.60.

**New York, N. Y.**—Borough of Brooklyn—For furnishing and delivering 5,000 bbls. Portland cement to J. P. Kane Co., 103 Park Ave., Manhattan; 40,000 grade 1 granite paving blocks, J. Leopold & Co., Inc., Woolworth Bldg., Manhattan; 40,000 asphalt paving blocks, Hastings Paving Co., 25 Broad St., Manhattan.

**New York, N. Y.**—(Borough of Brooklyn)—For repaving with permanent asphalt pavement on 6-in. concrete base, Surf Ave. from West 8th to West 20th St., to Barber Asphalt Paving Co., Woolworth Bldg., Manhattan, at \$22,777.

**New York, N. Y.**—(Borough of Bronx)—For improving Waterbury Ave., from Westchester to Zerega Ave., to J. Dimen-

na, 2435 Southern Blvd., New York, at \$13,068; Newbold Ave. from Castle Hill to Zerega Ave., to J. B. Malatesta, 3169 Jerome Ave., New York, at \$12,223.

**Rome, N. Y.**—For constructing 2 connecting highways, to Henry A. Schaupp, Gunderland, at \$23,111.

**Lincolnton, N. C.**—The Board of Aldermen has awarded contract to Noll Construction Co. to pave another block of town with asphaltic concrete, together with approximately three more miles of cement sidewalks.

**Portland, Ore.**—Clatsop county court has adopted bitulithic as type of pavement to be laid on four and one-half miles of highway between West and Columbia Beach on Astoria-Seaside route. Contract for improvement has been let to Western Paving Co. of Seattle, for sum of \$61,256.

**Eldred, Pa.**—For paving Main St. by Borough Council to Chenango Constr. Co., Albany, N. Y., at \$71,137.

**Phillippi, W. Va.**—For paving additional streets, to G. W. Diddler of this place.

**Seattle, Wash.**—Contract was awarded Jan. 11 for construction of Hazelwood-Newport Rd., Permanent Highway No. 12, to W. W. Wilcox, Sunnydale, on his bid of \$17,995. County engineer's estimate for the job was \$23,380. Following is list of bidders: Nettleton-Bruce-Eschbach Co., Am. Bank Bldg., \$22,500; M. P. Zindorf, Alaska Bldg., \$19,899; W. R. McDonald, Globe Bldg., \$20,731; Geo. Bandaret, Renton, \$19,999; Phillips-Engstrom-Dibble Co., Pioneer Bldg., \$24,949; Sloane Bros., 1717 Belmont Ave., \$20,200; L. H. Gourig, \$19,200; H. Brice, 4234 Denmore Ave., \$20,495; Mattson & Carlson, Tacoma, \$21,077; Jarbis & Burkheimer, Liberty Bldg., \$19,563; Russel & Gallagher, Central Bldg., \$21,433; Ferch & Gass, White Bldg., \$22,057; A. Peterson, Pioneer Bldg., \$21,850; Paul Gauy, Hazelwood, \$21,785.

## SEWERAGE

**Los Angeles, Cal.**—The project of great trunk line outfall sewer system covering whole county and emptying far out in Pacific looms before Los Angeles as result of hearing Jan. 12 before board of supervisors on question of the sewerage ordinance presented to board by residents of Ramona Acres and other communities as a protest against proposed sewer farm that Pasadena, South Pasadena and Alhambra intended to put into force near Ramona Acres. Hearing concluded with resolution of supervisors that commission consisting of five sanitary engineers be appointed to investigate the sewerage problem of the county and submit a feasible plan to the board at once. When this plan and report are received another hearing will be called at which it is expected that action will be taken.

**Los Angeles, Cal.**—Board has authorized construction of sewer in 3d St.

**Los Angeles, Cal.**—Council has ordered construction of sewer in Kingsley Drive, between Fountain Ave. and Sunset Blvd.

**Los Angeles, Cal.**—Council has ordered construction of sewer in Mohawk St. between Berkeley Ave. and Effie St.

**Sacramento, Cal.**—Commission has voted for construction of sewers on three streets.

**Sacramento, Cal.**—Plans for installation of concrete sewer along Freeport Rd. from Burnside Ave. to El Dorado Ave. were approved Jan. 11 by city commissioners.

**Averyville, Ill.**—Only one bid was received for construction of proposed sewer system from Daily & O'Brien of Peoria, Ill., at \$42,000. Engineer's estimate was \$33,600 and board therefore returned guarantee check and will make plans later for doing work.

**Chicago, Ill.**—Hammond board of public works passed resolution providing for the Calumet Ave. district sewer, estimated cost being \$215,563.30.

**Pontiac, Ill.**—Election will be held shortly to vote \$20,000 bonds for constructing a purification plant in connection with municipal sewerage system.

**Evansville, Ind.**—According to City Engineer J. D. Saunders' estimate, submitted to board of public works Jan. 11, cost of building the Blankenburg sewer according to plans adopted will be \$33,140.

**Fort Wayne, Ind.**—Board of Works has adopted resolution for sewer in Spy Run, running south from Edna St. along west side of Spy Run, crossing at Riverside

and continuing to river on east side of Spy Run Ave. Engineer has been ordered to prepare plans for opening of Dayton Ave. from Indiana to South Wayne.

**Ft. Wayne, Ind.**—City engineering department has completed a topographical map showing sewer in all territory east of Wabash Ave. and south of Maumee Ave. Work is soon to start on construction of large sewer on Warren St. from Maumee Ave. to New Haven Ave. into which all branches of sewers will empty.

**La Fayette, Ind.**—City Engineer H. E. Overesch, Jr. reports that plans and specifications for trunk line sewer are as follows: 4,067 lin. ft. of 15-in. s.s. vit. sewer, 10-12 ft. deep, at \$1.82, \$7,401.94; 150 lin. ft. of 18-in. d.s. vit. sewer, 0-8 ft. deep, at \$1.44, \$216.00; 150 lin. ft. of 18-in. d.s. vit. sewer, 8-10 ft. deep, at \$1.84, \$276.00; 1,700 lin. ft. of 18-in. d.s. vit. sewer, 10-12 ft. deep, at \$2.22, \$3,774.00; 82 lin. ft. of 18-in. d.s. vit. sewer, 12-14 ft. deep, at \$2.87, \$235.34; 438 lin. ft. of 20-in. d.s. vit. sewer, 10-12 ft. deep, at \$2.43, \$1,064.34; 254 lin. ft. of 22-in. d.s. vit. sewer, 0-8 ft. deep, at \$1.98, \$502.92; 425.5 lin. ft. of 27-in. d.s. vit. sewer, vit. segment block, reinforced concrete, 0-8 ft. deep, at \$3.33, \$1,416.92; 593 lin. ft. of 27-in. d.s. vit. sewer, vit. segment block, reinforced concrete, 8-10 ft. deep, at \$3.81, \$2,259.33; 1,005 lin. ft. of 27-in. d.s. vit. sewer, vit. segment block, reinforced concrete, 10-12 ft. deep, at \$4.13, \$4,150.65; 179 lin. ft. of 27-in. d.s. vit. sewer, vit. segment block, reinforced concrete, 12-14 ft. deep, at \$4.82, \$862.78; 747.5 lin. ft. of 30-in. d.s. vit. sewer, vit. segment block, reinforced concrete, 0-8 ft. deep, at \$3.35, \$2,504.12; 36 lin. ft. of 30-in. Cast Iron pipe, 0-8 ft. deep, at \$5.85, \$210.60; 167 lin. ft. of 33-in. d.s. vit. sewer, vit. segment block, reinforced concrete, 0-8 ft. deep, at \$3.58, \$597.86; 123 lin. ft. of 33-in. d.s. vit. sewer, vit. segment block, reinforced concrete, 8-10 ft. deep, at \$4.06, \$499.38; 766 lin. ft. of 33-in. d.s. vit. sewer, vit. segment block, reinforced concrete, 10-12 ft. deep, at \$4.39, \$3,362.74; 331 lin. ft. of 33-in. d.s. vit. sewer, vit. segment block, reinforced concrete, 12-14 ft. deep, at \$5.07, \$1,678.17; 608 lin. ft. of 33-in. d.s. vit. sewer, vit. segment block, reinforced concrete, 14-16 ft. deep, at \$5.45, \$3,313.60; 710 lin. ft. of 33-in. d.s. vit. sewer, vit. segment block, reinforced concrete, 16-18 ft. deep, at \$6.01, \$4,267.10; 121 lin. ft. of 33-in. d.s. vit. sewer, vit. segment block, reinforced concrete, 18-20 ft. deep, at \$6.44, \$779.24; 262 lin. ft. of 36-in. d.s. vit. sewer, vit. segment block, reinforced concrete, 0-8 ft. deep, at \$3.90, \$1,021.80; 120 lin. ft. of 36-in. cast iron pipe, 0-8 ft. deep, at \$7.85, \$942.00; 248 lin. ft. of 36-in. d.s. vit. sewer, vit. segment block, reinforced concrete, 8-10 ft. deep, at \$4.33, \$1,073.84; 1,352 lin. ft. of 36-in. d.s. vit. sewer, vit. segment block, reinforced concrete, 10-12 ft. deep, at \$4.73, \$6,394.96; 1,024 lin. ft. of 36-in. d.s. vit. sewer, vit. segment block, 12-14 ft. deep, at \$5.41, \$5,539.84; 1,364 lin. ft. of 36-in. d.s. vit. sewer, vit. segment block, reinforced concrete, 14-16 ft. deep, at \$5.78, \$7,883.92; 1,043 lin. ft. of 36-in. d.s. vit. sewer, vit. segment block, reinforced concrete, 16-18 ft. deep, at \$6.33, \$6,602.19; 145 lin. ft. of 36-in. d.s. vit. sewer, vit. segment block, reinforced concrete, 18-20 ft. deep, at \$6.72, \$974.40. 18,211 total lin. ft. of sewer. 22.8 cu. yd. concrete at \$5.00, \$114.00; 62 manholes at \$50.00, \$3,100.00; 3 drop manholes at \$60.00, \$180.00; 8 catchbasins at \$30.00, \$240.00; Grand Total, \$73,439.98.

The quantities are to be considered as approximate and are not to be held as entitling the contractor to any claim for extra time in the completion of the work, or to any claim for damages, if the quantity of work between the points stated should prove to be greater or less than here estimated. Profiles, plans and specifications, cross-sections and detail drawings of the work may be seen at the office of the City Engineer and the Board of Public Works. All bidders are cautioned not to submit their bids until said plans, profiles and specifications, cross-sections and drawings and the site of the work have been examined by them. The total length of the sewer given is the estimated length of the sewer. The actual length constructed will be paid for. Total length of the sewer as shown by profile is 18,211 lin. ft. Date of letting contract has not yet been fixed.

**Kenwood, Ia.**—Town is going to have a sewer system of its own despite refusal of Cedar Rapids to permit it to gain an outlet through this city. Mayor Wold to-day authorized an advertisement calling for sealed bids to be re-

ceived by construction consist of disposal plan.

**Lexington, Ky.**—In construction of sewer from land Ave.

**Lexington, Ky.**—In construction of sewer from land Ave.

**Lexington, Ky.**—In construction of sewer from land Ave.

**Lexington, Ky.**—In construction of sewer from land Ave.

**Lexington, Ky.**—In construction of sewer from land Ave.

**Lexington, Ky.**—In construction of sewer from land Ave.

**Lexington, Ky.**—In construction of sewer from land Ave.

**Lexington, Ky.**—In construction of sewer from land Ave.

**Lexington, Ky.**—In construction of sewer from land Ave.

**Lexington, Ky.**—In construction of sewer from land Ave.

**Lexington, Ky.**—In construction of sewer from land Ave.

**Lexington, Ky.**—In construction of sewer from land Ave.

**Lexington, Ky.**—In construction of sewer from land Ave.

**Lexington, Ky.**—In construction of sewer from land Ave.

**Lexington, Ky.**—In construction of sewer from land Ave.

**Lexington, Ky.**—In construction of sewer from land Ave.

**Lexington, Ky.**—In construction of sewer from land Ave.

**Lexington, Ky.**—In construction of sewer from land Ave.

**Lexington, Ky.**—In construction of sewer from land Ave.

**Lexington, Ky.**—In construction of sewer from land Ave.

**Lexington, Ky.**—In construction of sewer from land Ave.

**Lexington, Ky.**—In construction of sewer from land Ave.

**Lexington, Ky.**—In construction of sewer from land Ave.

**Lexington, Ky.**—In construction of sewer from land Ave.

**Lexington, Ky.**—In construction of sewer from land Ave.

**Lexington, Ky.**—In construction of sewer from land Ave.

**Lexington, Ky.**—In construction of sewer from land Ave.

**Lexington, Ky.**—In construction of sewer from land Ave.

**Lexington, Ky.**—In construction of sewer from land Ave.

**Lexington, Ky.**—In construction of sewer from land Ave.

**Lexington, Ky.**—In construction of sewer from land Ave.

**Lexington, Ky.**—In construction of sewer from land Ave.

**Lexington, Ky.**—In construction of sewer from land Ave.

**Lexington, Ky.**—In construction of sewer from land Ave.

**Lexington, Ky.**—In construction of sewer from land Ave.

**Lexington, Ky.**—In construction of sewer from land Ave.

**Lexington, Ky.**—In construction of sewer from land Ave.

**Lexington, Ky.**—In construction of sewer from land Ave.

received by town clerk Jan. 25 for construction of sanitary sewer system to consist of two complete sewerage disposal plants.

**Lexington, Ky.**—Board is considering extension of Central Ave. storm water sewer from Woodland Ave. to North Ashland Ave.

**Lexington, Ky.**—Substantial economies in construction of sanitary sewerage system and disposal plant with \$350,000 voted by people at the last election were recommended by Commissioner of Public Works McCorkle Jan. 19 in his report to mayor and the city commissioners. An estimated saving of from \$10,000 to \$15,000 to city in expenditure of money is possible, according to the commissioner. Commissioner McCorkle's recommendation that city engineers have charge of all outfall sewers in connection with new system was later adopted by Commissioners in executive session, while his further suggestion that city farm be utilized as a site for sewage disposal was favorably considered but not acted upon. It is estimated that if city farm is made to serve as a site for plant a saving of at least \$5,000 in purchase price of any other site will be effected, with additional expense of building longer sewers to a site more distant. The Solomon-Norcross Co., of Atlanta, Ga., was chosen by commissioners in executive session to draw plans, supervise construction, and attend to work in behalf of the city, and bids will be advertised for as soon as plans are complete.

**New Orleans, La.**—Plans for extension of drainage station No. 3 at Marigny and London Aves. were approved at meeting of Sewerage and Water Board Jan. 14. Contract will be known as 76-D, and will provide for installation of the big pumps such as are now at No. 1 and those being placed in No. 5.

**Haverhill, Mass.**—Louis C. Lawton, city engineer of Haverhill, appeared before harbor and land commission today in favor of a petition by city of Haverhill for permission to construct a sewer through and under Saltonstall Lake in city of Haverhill. Mr. Lawton told commission it would be possible to construct sewer around the lake, but that it was inadvisable if city could get right to build it through and under lake, as it would cost so much more money to build it around lake. The proposed sewer is to be a part of Kenosha Ave. system. There was no opposition to petition and it was referred to engineer of board, who will go over ground with Mr. Lawton.

**Lenox Dale, Mass.**—Fifteen Lenox Dale tax payers appeared before board of selectmen Jan. 13 to urge board to consider question of installing sewer system for village this summer. Board received the delegates and gave them encouragement to believe some definite action would be taken at annual meeting.

**Lowell, Mass.**—Charles J. Morse, commissioner of streets and highways, stated Jan. 14 that it would be necessary to borrow \$10,000 for contagious hospital sewer, and sooner money is borrowed, he said, sooner he will be able to start work on sewer.

**Marblehead, Mass.**—Town is discussing question of installing sewerage system at cost of from \$300,000 to \$400,000.

**Reading, Mass.**—See "Newton—Streets and Roads."

**Flint, Mich.**—Council has recommended that petition asking for sanitary sewer on State St. be granted.

**Port Huron, Mich.**—Engineers of International Waterways Commission recommend constructing an intercepting sewerage system in this city.

**St. Paul, Minn.**—Commissioner of public works has been authorized by council to prepare plans and specifications for sewer to be constructed on Wellesley Ave.

**Laurel, Miss.**—See "Streets and Roads."

**Erie, Pa.**—Ordinance is on file providing for construction of nine-inch diameter lateral sanitary sewer in 26th St.

**Chillicothe, Mo.**—City council Jan. 17 authorized City Auditor John W. Williams to advertise for bids for construction of 3-in. sewers as follows: Elmdale road—entire length from Locust St. to east line of road. Vine St., from south line of 11th St. to center line of Elmdale road. Calhoun St., from Dickenson St. to a point 1,700 ft. west.

**Bozeman, Mont.**—City Engineer Widener recommends construction of a sanitary sewer connecting outlets to sewers 1 and 2 and taking them to E. Gallatin River,

and outlet sewer from west end of Bozeman.

**Oriskany, N. Y.**—Village contemplates construction of sewerage system.

**Rochester, N. Y.**—Clerk Pifer has been instructed to advertise for bids for furnishing a grit excavator for use at sewage disposal plant.

**Salem, O.**—City contemplates construction of sewer on West Green St. and Council has accepted estimate of City Engineer French which calls for expenditure of \$900.

**Massillon, O.**—Petitions from Akron St. residents living between Lake St. and the end of the sewer in Akron St. asking that city build a sewer in that portion of the street was presented to council and referred to sewers committee.

**Cranston, R. I.**—An improvement for which a movement has been begun, and in which it is expected that cities of Cranston and Providence will co-operate, is Mashapaug Brook sewer. Committee appointed by the Cranston city council some months ago has had several meetings, and is now awaiting appointment of a similar committee from city council of Providence.

**Venus, Tex.**—In a city election held Jan. 11 sewerage bonds of \$10,000 were voted by majority.

**Salt Lake City, Utah.**—City will receive bids until Feb. 1 for \$175,000 bond issue for sewerage purposes.

**Salt Lake City, Utah.**—See "Water Supply."

**Seattle, Wash.**—Council has ordered construction of sewers on several streets.

**Milwaukee, Wis.**—Bond ordinances introduced in meeting are as follows: \$1,550,000 for the sewage disposal plant, \$300,000 for the lake shore drive, \$240,000 for a bridge across North Ave., \$750,000 for the purchase of street lighting equipment, \$200,000 for harbor improvements, 50,000 for an animal house in the Washington Park Zoo; \$20,000 to complete the grandstand at the race track in Washington Park and \$50,000 for a police station on west side. The ordinance providing for a new police station was introduced by Aid. Wittig and it is the only one of number which carries provision for referendum.

**Sheboygan, Wis.**—See "Streets and Roads."

**Basin, Wyo.**—At meeting of council Jan. 11 upon application of United States Government an ordinance was passed granting to United States a franchise for construction at its own expense of private sewer commencing at point on 4th St. opposite post office site and running northwardly approximately 300 ft.

#### CONTRACTS AWARDED.

**Los Angeles, Cal.**—To John Sutalo for construction of sewer in Lexington Ave. at \$978.

**Los Angeles, Cal.**—To B. Z. Wucetich for construction of sewer in Front St. at \$740.

**Los Angeles, Cal.**—To W. Z. Wucetich for construction of sewers in Granada St. and Harbor Blvd.

**Stockton, Cal.**—Chambers & Heafey will be awarded contract for constructing storm sewers in southern part of city because this firm submitted lowest bid. The Oaklanders' bid was \$21,330.37. There were nine bids submitted, as follows: Chambers & Heafey, \$21,330.37; D. Bishop, Stockton, \$24,093.64; Tibbetts-Pacific Co., San Francisco, \$27,941.79; Frank S. Orstranger, San Francisco, \$23,062.65; Marin Rock Co., San Anselmo, \$21,989.41; Fred Meyers, Richmond, \$22,460.36; F. C. McIntire, Stockton, \$21,761.38; C. D. Vincent, Sacramento, \$23,360.69; and W. F. Edwards, Oakland, \$23,474.98.

**Clinton, Ia.**—By city council, for construction of sewer on 1st St., to C. M. Neal of this city, Jan. 11. Six bids were submitted for construction of the First St. sewer, as follows: C. R. Pollock, Dubuque, \$5,324.86; Hydraulic Construction Co., Davenport, \$5,669.50; D. O. Keeler & Co., Davenport, \$5,852.30; C. B. McNamara & Co., Dubuque, \$5,832.40; Thomas Carey & Sons, Clinton, \$5,504; C. M. Neal, Clinton, \$4,878.40.

**Woodbine, Ia.**—For constructing a sanitary sewer system to H. J. Peterson, Omaha, Neb., at \$15,823. I. A. Bruce, Omaha, Neb., is Engr.

**Boston, Mass.**—For constructing Dorchester Brook sewer to West Roxbury Trap Rock Co., Grove St., West Roxbury, at \$34,278.

**Mt. Morris, Mich.**—Common council of village of Mt. Morris has entered into contract with Caster Bros., of St. Charles, to drill first of 8-in. wells for

water works purposes. Caster Bros. will ship to Mt. Morris their latest drilling machine and by terms of contract will begin work on or before first of next month. Common council has also entered into an agreement with Sarah A. Louis of city of Detroit and has secured an option on her lot adjacent to school grounds where well will be drilled. If water is found in sufficient quantities the property will be purchased. There are a number of deep wells in this vicinity and local well-diggers claim the strata provides the best of water.

**Irvington, N. J.**—By Town Commissioners to John Dorer, Park Ave., Irvington, for constructing extension to Ball St. sewer at \$27,791.

**Cincinnati, O.**—For improving sewers in Colerain Ave. to Thomas P. Strack, Cincinnati, at \$11,971.

**South Bethlehem, Pa.**—For construction of sewer on South Selfridge St. and West Poplar Ave., to Archangelo Angier, the lowest bidder. Mr. Angier's bid was 50 cts. per lin. ft. Thomas B. Briody was only other bidder, his bid being 70 cts. per lin. ft.

**Annarcor, Wis.**—For construction of lateral sewer, between 6th and 7th St. west of M Ave., to Nels Erickson, at \$2,227.85.

**Superior, Wis.**—At a meeting Jan. 15 board of public works formally awarded contract for construction of sewer between West 1st and West 2nd Sts. and Newton and Richardson Aves. at East End to Contractor Axel Johnson. Among six bids submitted to board Johnson's offer of \$1,698.50 was low. Other bids submitted were: John Anderson, \$1,796.80; Axel Holm, \$1,777.59; Smith Bros. & Co., \$1,830.70; Anderson & Co., \$2,020; M. Nacabson & Co., \$1,754.05.

**Superior, Wis.**—At a meeting Jan. 17 board of public works formally awarded contract to M. Jacobson & Co. for construction of sewer between West Fourth and West Fifth Sts. and Newton and Richardson Aves. Jacobson's bid of \$807.87 was low. Six other bids were received as follows: Anderson & Co., \$1,024; Andrew Johnson, \$887; John Anderson, \$1,183.60; Smith Bros. & Co., \$946.20; Andrew Holm, \$1,192.60; S. A. Riches, \$1,080.

#### WATER SUPPLY

**Sierra Madre, Cal.**—City is planning installation of new water mains at a cost of \$60,000.

**Washington, D. C.**—In connection with Confidential Circular No. 831 regarding bids for water pipe and accessories for a city in Central America, the bureau has received a supplementary statement that American capitalists may have an opportunity to purchase enterprise referred to. Copy of supplemental report may be obtained from Bureau of Foreign and Domestic Commerce or one of its district offices by referring to file No. 71340.

**Savannah, Ga.**—R. B. Dole, government engineer, has recommended improvements to water works, including construction of filtration plant; probable cost \$240,000.

**Chicago Heights, Ill.**—Water committee have authorized Layne & Bowler to install 1,500 gallon low-pressure pump which may be converted into high pressure pump if desired later, at cost of \$1,500. Pump is guaranteed to lift water with 60 horse power.

**Clinton, Ill.**—Citizens will vote shortly on bond issue of \$12,500 for reconstruction of reservoir and installation of high-pressure pump.

**Decatur, Ill.**—Council considering construction water mains in territory north of Grand Ave. and west of Monroe St., extending north to Sawyer St.; estimated to cost \$11,257.

**Orleans, Ind.**—Orleans Water Co. incorporated and will construct water works here. Water will be derived from driven wells. J. B. Marvin of Frankfort is engineer.

**Clinton, Ia.**—Resolutions have been passed providing for installation of water and gas connections on 1st St., from 4th to 7th Aves., and on 7th, 6th, 5th and 4th Aves., from 1st to 2nd St., along the lines of proposed new paving.

**Billierica, Mass.**—See "Streets and Roads."

**Clinton, Mass.**—The water commissioners have been given authority to make a contract with town of Lancaster for sale of water to that town under Article 2.

**Lowell, Mass.**—At meeting of municipal council Jan. 13 it was voted to petition legislature for loan of \$25,000 for com-

pletion of filtration plant and \$75,000 for extension of water mains and enlarging high service mains.

**Lynn, Mass.**—Purchasing Agent Carleton has called for bids for year's supply of following materials: 25 tons Omaha pig lead for water department; 25 carloads of Portland cement; 5,000 cu. yds. of sand; 20 carloads of sewer pipe; castings of all kinds for water department; 100,000 bricks; rough curbing; 3,000 pieces of brass for water department; 700 tons cast iron pipe for water department; 50 carloads road oil, 40 per cent. asphaltic base; and 12 tons of fertilizer for the cemeteries.

**Richmond Hill, Mass.**—Plans for laying of large pipe line from high pressure reservoir in Notch across hills to Richmond Hill and adjacent section, are being considered by public works department.

**Clio, Mich.**—Plans and specifications for water works system for village of Clio have been submitted to council by Russell Murdock, of Detroit, an engineer employed by council to prepare plans and make an estimate of cost of installing system. Estimated cost of installing system is placed at \$25,000 by engineer. It is believed that village can bond for this sum. Proposition will probably be submitted to vote in the spring.

**Highland Park, Mich.**—Two new pumping engines, larger storage reservoir and filtration plant were recommended for Highland Park's water system in written report of W. G. Hoad, consulting engineer from University of Michigan, which was read to village council Jan. 17. As result of recommendations council voted to have two new engines installed at once at Dequindre St. station. Machines will cost about \$1,700 each.

**Jackson, Mich.**—City is discussing plans for improvement of water works system. Estimated cost, \$29,000.

**Saginaw, Mich.**—Board of water works contemplates installation of new water mains in Washington Ave. from Janes Ave. to Johnson St. H. H. Eymer is city engr.

**Mankato, Minn.**—City plans construction of reservoir of 1,500,000 gallons capacity at approximate cost of \$15,000.

**Philadelphia, Miss.**—Mayor and Board of Aldermen have ordered another election for Feb. 1 to decide whether bonds in sum of \$30,000 shall be issued for erection of a water works plant to be owned by town, taking place of the plant now owned and operated by A. J. Mayo.

**Great Falls, Mont.**—Special election will be held Feb. 5 to submit question of \$150,000 water bonds.

**Lovelock, Nev.**—By vote of 361 to 37 city Jan. 15 authorized a \$90,000 bond issue to bring water from springs in the Humboldt mountains. Spection commission will be appointed by Humboldt county commissioners to locate source of supply and to install complete water system.

**Watertown, N. Y.**—Movement is on foot for installation of new water system. Plans will be discussed at February meeting.

**Hendersonville, N. C.**—City authorities are planning for \$150,000 new water

supply and system to be installed at Thompson & Clay, New York, and Caldwell. A reservoir to hold from 2,000,000 to 6,000,000 gallons will be constructed on crest of Long John Mountain half a mile from city. A mass-meeting of citizens will be called at which time proposed bond issue of \$150,000 will be discussed.

**Dresden, O.**—City council has voted \$8,000 bonds for improving water works system.

**Pittsburgh, Pa.**—Ordinance providing for appropriations of \$100,000 for purchase of water meters has been held over at suggestion of Dr. G. A. Dillinger, who wanted further report from department of public works.

**South Bethlehem, Pa.**—Expiration of contract with Bethlehem City Water Co. for fire hydrant supply on Jan. 1, was announced by Secretary Ganey. Law committee was instructed to procure information by investigation before new contract is made.

**Copperhill, Tenn.**—Election will be held Feb. 5 to vote on \$20,000 bonds for water works and sewer system.

**Lonsdale, Tenn.** (Knoxville Post office).—Citizens have voted \$30,000 bonds for water works system.

**Allee, Tex.**—City commission Jan. 17 ordered an election to be held Feb. 26, 1916, to ascertain whether or not property taxpayers voters will authorize commission to borrow \$6,000 by mortgaging water works system, money to be used in extension of that system.

**Dallas, Tex.**—City contemplates purchase of 1,500 water meters.

**Tyler, Tex.**—Citizens have voted in favor of \$250,000 bond issue for water works.

**Salt Lake City, Utah.**—City plans to sell \$125,000 bond issue for water works purposes. Bids will be received until Feb. 1.

**Salt Lake City, Utah.**—Resolution directing the recorder to advertise for bids on sale of last \$300,000 segment of city's water and sewer bonds, was passed by unanimous vote of the city commission Jan. 13. Of amount of bonds to be sold \$175,000 is to be used for waterworks improvements and \$125,000 for sewers.

**Portsmouth, Va.**—Special water committee, to whom matter of looking into advisability of making new contract with the water company or report upon advisability of acquiring property of the water company, submitted its report recommending that, as a matter of form in compliance with contract, that council serve notice through city attorney that city intends to take steps looking to acquisition of their properties. Recommendation was adopted without discussion, and now goes to Board of Aldermen for concurrence.

**Sheboygan, Wis.**—Resolution to instruct water commission to cause suitable mains to be laid in Bluff Ave. from Third to Fourth St. has been referred to committee on fire department.

**Everett, Wa.**—Bids will be received until Feb. 1, at 10:30 a. m., at office of Louis Lesh, city clerk, for purchase of \$600,000, city water supply bonds. Interest not to exceed 5 per cent. and \$1,100,000 of water revenue fund bonds, interest not to exceed 6 per cent. Check for \$10,000 to accompany each bid. Dillon,

#### CONTRACTS AWARDED.

**Fullerton, Cal.**—To Western Reinforced Concrete Pipe Co., 1611 East Sixth St., Los Angeles, by Anaheim Union Water Co. for 535 ft. concrete pipe inverted siphon, 60 in. diameter, to replace flume.

**New Britain, Conn.**—The contract for 1,000 ft. of 4-in., 2,000 ft. of 6 and 8-in. and 1,500 ft. of 12-in. pipe to R. D. Wood of Philadelphia. The bids were as follows: M. J. Drummond, New York, \$33.83 for 4-in. and \$30.83 for the other sizes; Donaldson Pipe Co., of Emaus, Pa., \$33.84 for 4-in. and \$30.84 for the other sizes; Standard Pipe Co., Bristol, Pa., \$34.25 for 4-in., \$31.25 for 6-in., and \$30.25 for 8 and 12-in.; R. D. Wood, of Philadelphia, \$33.20 for 4-in. and \$30.20 for other sizes. The contract will amount of \$4,680. On the 5,000 ft. of pipe they ordered six weeks ago the board saved \$260 as the price has since advanced \$3 a ton. P. J. Eagan, Clerk.

**Jacksonville, Fla.**—Standardization and water committees of board of bond trustees met Jan. 14 in city hall annex and awarded contract for purchase of iron water pipe for high pressure line on East Bay St. to the United States Iron Pipe & Foundry Co. of Memphis.

**Jacksonville, Fla.**—To United States Iron Pipe & Foundry Co., of Memphis, Tenn., for iron water pipe for high pressure line on East Bay St.

**Chicago, Ill.**—For furnishing water pipe 12, 24 and 48-in., 11,325 tons to U. S. C. I. Pipe & Foundry Co., 122 South Michigan Ave., at \$27.75 per ton; total, \$314,209. To Glamorgan Pipe Co., 209 S. LaSalle St., for furnishing 7,500 tons c. i. pipe at \$26.85 per ton.

**Miller, Ind.**—Proposed water works system: For water tower, to Chicago Bridge & Iron Works; for pipe, valves, hydrants, etc., to National Tube Co.; for pump, to Worthington Pump Co.; for motor, to General Electric Co.

**Sheldon, Ia.**—To A. A. Dobson Co., of Lincoln, Neb., at \$6,000, for deepening well, laying tile, etc.

**Chanute, Kan.**—Merkle-Hines Machine Co., Kansas City, Mo., for low service pump direct connected to electric motor at \$19,200. C. G. Wood is City Clerk.

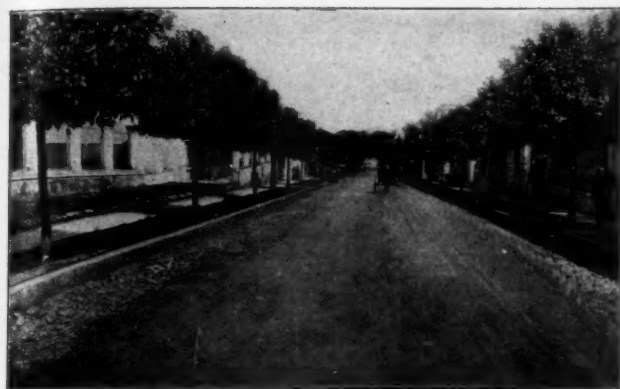
**Worcester, Mass.**—To Brame, Dow & Co., of Boston, for furnishing 25,000 ft. of 1-in. water pipe and 5,000 ft. of 1½-in. pipe.

**Baker, Ore.**—To the Utah Concrete Pipe Co., Salt Lake City, Utah, at \$46,327.59, for constructing extension to water system. Other bidders were: Washington Brick, Lime & Sewer Pipe Co., Spokane, Wash., \$43,211.25; Portland Cement, Pipe Tile Co., Portland, Ore., \$48,006.01; J. C. White, Baker, Ore., \$48,453.70; Chas. Storey, Boise, Ida., \$49,711.40; L. Y. Stayton, Tacoma, Wash., \$52,524.75; Arenx & Rosendorf, Portland, Ore., \$55,645.25; J. O. White, Baker, Ore., \$61,626.35; Cement Pipe Co., Salt Lake City, Utah, \$46,327.59.

### TOO LATE FOR CLASSIFICATION

#### BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
<b>STREETS AND ROADS</b>				
Ia., Clinton	.....	8 p.m., Feb. 8..	Grading, paving with brick and constructing combined curb and gutter .....	F. W. Leedham, City Clerk.
<b>SEWERAGE</b>				
N. Y., Lewiston	.....	8 p.m., Feb. 15..	Laying 400 feet 8-in. sewer .....	A. C. Peabody, Engr.
Ind., Kendallville	.....	Feb. 29..	Constructing sewer, estimated cost \$38,845.45.....	City Engineer.
<b>WATER SUPPLY</b>				
Texas, Galveston	.....	Feb. 3..	Constructing three new wells.....	J. E. Kelley, City Secy.
N. Y., New York	.....	10:30 a.m., Feb. 4..	Furnishing pipe and fittings.....	Robt. Adamson, Fire Comr.
Tex., Galveston	.....	Noon Feb. 10..	Sinking three 12-in. wells.....	J. E. Kelley, City Secy.
N. Y., Lewiston	.....	8 p.m., Feb. 15..	Furnishing 500 tons 4 to 10-in. c. i. pipe, 47 hydrants, 49 valves and valve boxes and pumping equipment; constructing 275,000 gal. filtration plant, 85-ft. steel stand pipe and hauling and laying 29,000 ft. 4 to 10-in. pipe .....	A. C. Peabody, Engr.
<b>MISCELLANEOUS</b>				
Wis., Sheboygan	.....	4 p.m., Jan. 31..	Furnishing horse-drawn or motor-driven street flusher.....	C. U. Boley, Ch. Bd. Pub. Wks.
N. J., New Brunswick	.....	9 a.m., Feb. 4..	Furnishing ditching machine .....	Mosquito Commission.
Ind., Indianapolis	.....	Feb. 4..	Oil for sprinkling sts. (minimum of 753,000 gals.....)	E. J. T. Jeup, City Engr.



**View 1**—Looking down General Lee Street from intersection of Dolores Street, Marianao, Cuba. View taken April 1915. Plain macadam laid in October 1914. Note destruction of gutters by tropical rains.



**View 2**—Looking up General Lee Street from intersection of Dolores Street, Marianao, Cuba. View taken April 1915. Tarvia macadam laid in August, 1914.

## Tarvia versus Tropical Rains

**H**ERE is a street in Marianao, Cuba, which was paved with plain macadam.

**View 1** shows what it looked like six months later with the gutters all washed out by the tropical rains so that the two sides of the road were mere heaps of broken stone.

**View 2** shows an adjoining section of the same street which was paved with Tarvia macadam a short time previously. But after six months, as the view shows, the tarviated-macadam was just as good as new and the heavy rains had not injured it a particle.

The relative superiority of Tarvia shown in this test in Cuba holds good for this country except that the contrast will not be

so promptly shown. Nevertheless the superiority of tarvia-bonded macadam is speedily apparent.

To be sure, tarvia-macadam costs

a little bit more to build than plain, water-bonded macadam, but it lasts so much longer and requires so much less maintenance

that the extra first cost is more than repaid.

In the long run plain macadam is very expensive because it was not designed for modern automobile traffic and quickly disintegrates when its tender surface is subjected to twentieth century traffic.

Booklets discussing the road problem in detail, on request. Address our nearest office.

**Tarvia**  
Preserves Roads  
Prevents Dust

### Special Service Department

This Company has a corps of trained engineers and chemists who have given years of study to modern road problems. The advice of these men may be had for the

asking by anyone interested. If you will write to the nearest office regarding road problems and conditions in your vicinity the matter will have prompt attention.

### BARRETT MANUFACTURING COMPANY

New York Chicago Philadelphia Boston St. Louis Cleveland Cincinnati Pittsburg  
Detroit Birmingham Kansas City Minneapolis Salt Lake City Seattle Peoria  
THE PATERSON MANUFACTURING CO., Limited: Montreal Toronto Winnipeg Vancouver  
St. John, N. B. Halifax, N. S. Sydney, N. S.



## PROPOSALS

**NOTICE INVITING PROPOSALS AND BIDS FOR THE RE-PAVING OF STREETS AND THE CONSTRUCTION OF CONCRETE GUTTERS, WITHIN SPECIAL IMPROVEMENT DISTRICT NO. 198, CITY OF BUTTE, STATE OF MONTANA.**

Sealed proposals or bids for re-paving the streets and construction of concrete gutters on the streets, within Special Improvement District No. 198, are hereby invited and will be received by the City Council of the City of Butte, State of Montana, at the hour 7:30 o'clock p. m., February 2nd, 1916. Said proposals or bids to be filed with the City Clerk prior to the above mentioned time and to be opened at the regular meeting of the said City Council to be held Wednesday, February 2nd, 1916, at 7:30 o'clock p. m., at the Council Chambers.

Said proposals or bids to be received for the following types and kinds of paving and improvements:

Creosoted Wood Lug Block Paving  
Bitulithic Paving  
Asphaltic Concrete Paving

Plans, specifications and forms of bids are on file in the office of the Commissioner of Public Works, Butte, Montana, and be had by making a deposit of five (5) dollars, which will be refunded on the return of the specifications.

**FOR SALE. One forty-five horsepower Knox Tractor, capacity eight tons. Will sell either with the dump wagons or without. This machine has only been used about six months. Address, Henkel & Sullivan, No. 710 Mercantile Library Bldg. Cincinnati, Ohio.**

## FOR SALE CHEAP

Wrought Pipe, second hand, all sizes, recut and rethreaded suitable for all classes of work. Prices quoted on application.

**MARINE METAL & SUPPLY CO**  
167 South Street, New York City

## FOR SALE

One "OO" Austin Trenching Machine with ten-foot extension, nearly new. Address J. E. Poin-dexter, Receiver, Fayetteville, Tennessee.

## STREETS AND ROADS

**Wilmington, Del.**—Plans are being made for paving of number of streets during this year, including Fourth St. from Market to Adams.

**Americus, Ga.**—A meeting of a body of representative citizens of Americus have asked the mayor and City Council to call election for purpose of voting on issue of bonds amounting to \$30,000 for street work and improvements. It is very probable that city fathers will call the election at their next regular meeting, January 25.

**Danville, Ill.**—The first work toward obtaining system of good roads in Vermillion county since the Supreme Court a short time ago upheld as valid bond issue of county was selling of \$1,000,000 bonds, which was the action of Board of Supervisors. Four bids were received and opened. The Harris Trust & Sav-

ings Bank and the First Trust & Savings Bank of Chicago offered \$983,400 for the bonds, with accrued interest from date of delivery. The board accepted their offer unanimously. Eight bids for furnishing cement for roads were rejected.

**Edwardsville, Ill.**—By unanimous viva voce vote County Board of Supervisors on Jan. 20 adopted resolution providing for appointment of committee to gather details concerning proposed \$1,250,000 hard road bond issue for Madison County.

**Kokomo, Ind.**—The following bonds have been sold: Wright road, Monroe Township, \$9,800 plus premium of \$218.50; Johnson road, Center Township, \$4,400, premium \$153.50; McReynolds road, Center Township, \$4,800, premium, \$82.50; Howell road, Center Township, \$13,600, premium \$307.50; Eikenberry road, Honeycreek Township, \$11,800, premium \$264.25. As soon as transcripts for these roads are approved by attorneys of company the money will be paid into road fund and work on the roads can be started.

**Richmond, Ind.**—Board has approved resolution for paving of South Ninth St., from Main St. to South A St.

**Lexington, Ky.**—Street improvement bonds to value of \$8,900 have been sold to Carey-Reed Co., which has contract for improvement of South Limestone St.

**Morganfield, Ky.**—It was voted by Fiscal Court that Norman P. Orcutt, surveyor, prepare and report to body within 30 days plans, profiles and specifications on Boxville woods to Webster County line. This road is to be continuation of Uniontown and Boxville road, now in course of construction, and will have length of nine miles.

**Westfield, Mass.**—Superintendent of Streets C. A. Moore in his annual report favors improvement of School, Meadow and Union Sts.

**Minneapolis, Minn.**—City Council, at its adjourned meeting Jan. 21, voted on the \$1,090,000 paving plan for 1916. It also considered immediate sale of \$600,000 worth of paving bonds as recommended by ways and means committee.

**Beatrice, Neb.**—A number of new paving districts will be created in Beatrice this year, boosters for propositions now being out with petitions which will be submitted to City Commissioners within next few weeks. Petitions for more than 36 blocks of paving are now being circulated or will be started within a few days. A proposition which is being backed by Mayor Mayer is for repaving of Court St. from Seventh to Thirteenth. According to plans which have been drawn, it is proposed to repave about 18 feet on each side of the street, leaving in the center space about 14 feet wide which will be planted to grass and shrubs. Under this arrangement cost of repaving would be reduced considerably and effect upon city would be a pleasing one.

**Elizabeth, N. J.**—With the passage of three resolutions providing for publishing of notices of intention to improve New Point road, between East Jersey and Seventh Sts., Grove St., between Jersey and Linden Aves., and Seventh St. between Elizabeth and First Aves., the board of works started on Jan. 20 the 1916 paving program. Grove St. is to be paved with brick, while other two streets are to be paved with oblong trap block. There will be concrete foundation in each case.

**Flemington, N. J.**—Board of Freeholders has instructed Grant Davis, county engineer, to forward plans and specifications for proposed Larison's Corner-Revville, Califon-West Portal and Hoffman's-Califon macadam roads to State Road Department at Trenton for approval. Just what length of the three roads will be built this year will depend somewhat upon money that will be available for improved roads during the present year.

**Newton, N. J.**—Plans are being made by Sussex Board of Freeholders and State Road Department for improvement of three highways in county at cost of \$160,000. These highways will give a complete circuit of improved roads starting from Newton, the county seat, and connecting nearly all of important towns. The contract for the Newton-Sparta road has been awarded, but the actual work has been delayed by winter.

**Passaic, N. J.**—Petition for improvement of Van Houten Ave. has been presented.

**Little Falls, N. Y.**—Vast improvements as to paving of city are under way. At meeting of board of public works the

greater part of evening was taken up in discussing this project. A resolution was prepared to present to Common Council at next meeting to raise bond issue of \$50,000 to pay for city's share of paving part of the streets that are in dire need of paving.

**Utica, N. Y.**—At office of County Controller J. H. Carroll sealed proposals will be received until 11 a. m., Feb. 2, for registered bonds of county of Oneida in amount of \$100,000. These bonds are highway funding bonds and bids may be for any part or entire issue. The bonds are to be dated Feb. 15, 1916.

**Watertown, N. Y.**—Feb. 4 will be fixed by board of public works at meeting as date for public hearing on plans for paving of south side of Public Square, which it is proposed to lay during coming summer.

**Monmouth, Ore.**—Movement has been inaugurated to pave Monmouth's main street and election may be called soon on the question.

**Salem, Ore.**—An Oregon beach highway, to extend from Astoria, Ore., to Crescent City, Cal., is recommended in annual report to Highway Commission.

**Bartlettville, Tex.**—In bond issue election held here Jan. 17 for issuance of \$24,000 for the pavement of Main St. the result was 132 for and 79 against. Work will commence as soon as bids can be received.

**Corsicana, Tex.**—Petitions have been received for various street improvements.

**Dallas, Tex.**—A petition asking for paving of East Side Ave. from Garrett Ave. to Beacon St. with bitulithic was filed with City Street Commissioner Otto H. Lang Jan. 18th. The petition is signed by 95 per cent. of the property owners interested. If petition is granted and paving laid important loop will be completed in East Dallas. East Side is paved at present to Garrett. Beacon is paved from East Side to Columbia, and Fitzhugh is paved from East Side to Columbia. A paved loop around East Side, Beacon, Columbia and Fitzhugh thus would be provided.

**Galveston, Tex.**—Charter amendment has been voted on to authorize issuance of \$250,000 of bonds to pave, drain and improve streets, alleys and public grounds of city.

**Vernon, Tex.**—A joint meeting of the Young Men's Business League and the farmers and merchants of Wilbarger County was held Jan. 18 in auditorium of city hall here for purpose of discussing better roads. The question was discussed at length by those present and county campaign for better roads was planned. Especial stress was laid on fact that the Gulf of Colorado Highway, crossing Wilbarger County, should be repaired.

**Coupeville, Wash.**—Board of County Commissioners have decided to spend all state aid road money due county for part of 1915 and all of 1916 on construction of Lin's corner Bay View trunk highway.

**Everett, Wash.**—Committee from Sultan has asked County Commissioners to pave county road through Sultan just as soon as possible as Council wishes to pave its share of street at same time. County's appropriation is \$13,500.

**Olympia, Wash.**—State Highway Commissioner W. R. Roy has been authorized to call for bids for construction of 10 miles of Sunset highway from Ellensburg to Vantage on Columbia River. Approximate cost, \$29,475.

**Port Townsend, Wash.**—Commissioners Eldridge and Bowman have signed resolution favoring expenditure of money on road running from present Ludlow-Chimacum permanent highway to point on Quilcene road near Center, and Commissioner Wanamaker signed resolution favoring use of money of main Quilcene road beginning at end of state aid near Forester's hall and running toward city.

**Seattle, Wash.**—Resolutions have been adopted for grading Macy St. at cost of \$9,656.76, and paving Beacon Ave. at cost of \$202,301.83.

**Superior, Wis.**—Property owners on 58th St., South End, have filed petition with City Commission asking that that street be paved this coming summer. The petition will be acted on at next meeting of Council.

**Wellburg, W. Va.**—The Brooke County Court has decided to hold bond issue for purpose of improving roads of the county. The call was issued for \$300,000 and roads to be repaired are to be specified. Work on the bond issue is to start immediately, and while election date has not been set it is expected to be held in the spring.